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AGRICULTURAL Chemicals

John A. Miller
NPFI
President

IN THIS ISSUE:

- Potash Sizes
- Pesticide Surfactants
- Forest Fertilization
- Pesticide Outlook
- NPFI Convention
- The Custom Applicator
- Care of Spray Equipment
- Pests on Alfalfa

C. T. Prindevil
NPFI
Vice-Presiden

JUNE, 1958

The name BAGPAK is a standard of leadership, and of quality…for BAGPAK means *complete* production control in bag manufacture, from the planting of seedlings which eventually produce pulp, to the delivery of the finished sack to your plant —in fact, even to the furnishing of special filling and closing machines to insure the best protection for your product.

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New 60% Standard Muriate
New 60% Special Granular Muriate
New 60% Coarse Granular Muriate
Sulphate of Potash
Chemical Muriate — 99.9% KCL minimum

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Soil Insects
Grasshoppers

EAST
Forage Insects
Soil Insects
European Chafers

SOUTH
Cotton Insects
Tobacco Insects
Peanut Insects
Soil Insects, Corn
Soil Insects, Potatoes
Soil Insects, Nursery Stock
Soil Insects, Truck Crops
Rough Headed Corn Stalk Beetles
Sweet Potato Weevils
Sugar Cane Insects

CENTRAL
Soil Insects
Forage Insects
Bluegrass Bugs
Tobacco Insects
Sweet Clover Weevils
Grasshoppers

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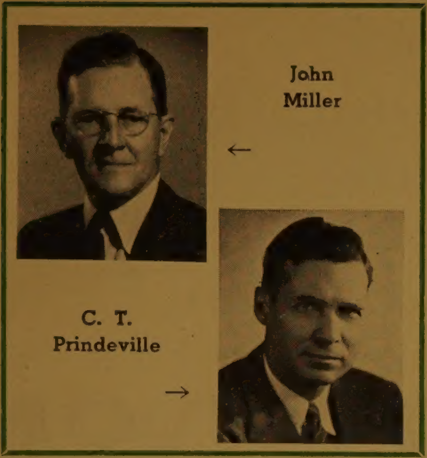

This Month's Cover

John A. Miller, president of the National Plant Food Institute and C. T. Prindeville, vice president, who will be presiding at the annual meeting of the NPFI, June 15-18 at the Greenbrier Hotel, White Sulphur, W. Va. (see page 33 for story.)

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Vol. 13, No. 6 June, 1958

AGRICULTURAL Chemicals

ARTICLES

POTASH SIZES (Part 1) 28
Comments by R. D. Tayloe, J. D. Macarthur, Albert Spillman, and E. Kapusta
USE OF SURFACTANTS WITH AGRICULTURAL CHEMICALS 31
By Virgil Freed
NATIONAL PLANT FOOD INSTITUTE CONFERS AT WHITE SULPHER.... 33
THE 1958 PESTICIDE OUTLOK 34
Comments by S. H. Bear, S. Besthoff, C. Behse, Ray Cooney, C. Campmeier, L. Gemmel, J. F. Hanley, J. J. Papai, W. R. Peele, P. J. Reno, Roger Roth
FOREST FERTILIZATION 40
CARE AND MAINTENANCE OF POWER SPRAYERS 50
By L. Duffy
THE CALIFORNIA AGRICULTURAL AIRCRAFT ASSOCIATION 57
WACA MEETING HELD IN LOS ANGELES 72

FEATURES

INDUSTRY CALENDAR 15
IN THE SPOTLIGHT THIS MONTH 15
EDITORIAL 27
WASHINGTON REPORT 42
By Donald Lerch
FERTILIZER VIEWS AND NEWS 45
By Vincent Sauchelli
THE CUSTOM APPLICATOR 47
PEST ROUNDUP 59
By Kelvin Dorward
TECHNICAL SECTION 67
THE LISTENING POST 64
By Paul Miller
INDUSTRY NEWS 75
TRADE ASSOCIATION LISTING 102, 129
SUPPLIERS BULLETINS 110
PROFESSIONAL DIRECTORY 129
CLASSIFIED ADVERTISING 131
ADVERTISER'S INDEX 133
TALE ENDS 134

PUBLISHED monthly on the 1st, by Industry Publications, Inc.

ADVERTISING and Editorial Office, P. O. Box 31, Caldwell, New Jersey.

PUBLICATION Office: 123 Market Pl., Baltimore, Md.

ENTERED as second-class matter November 4, 1949 at the Post Office at Baltimore, Md., under the Act of March 3, 1879.

SUBSCRIPTION RATES: United States, 1 year, $3.00; 2 years, $5.00. Canada and Pan American countries., 1 year, $4.00; 2 years, $7.00. All other foreign countries, 1 year, $9.00; 2 years, $15.

SINGLE COPIES: current issue: $0.50; all back numbers $1.00. Postage and handling charges for foreign countries on single copies: $1.00. Claims for missing numbers will not be allowed if received more than 60 days from date of mailing. No claims allowed from subscribers arising from failure to notify the Circulation department of a change of address, or because a copy is "missing from files."

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ever-improving
product
and
production

"WE CASHED IN ON

reports Damon Robinson
Manager, Plant Food Division
Kelly-Weber & Company, Inc.
Lake Charles, La.

International's Charter Carports of Triple dock at the Port of Lake Charles "just a stone's throw" from the Kelly-Weber plant at Westlake. Triple is transferred by dragline to dump trucks. At the plant, Triple is elevated from hopper into storage area. In addition to the triple, all phosphate rock (storage piles in the background) and sulfuric acid are shipped by water.

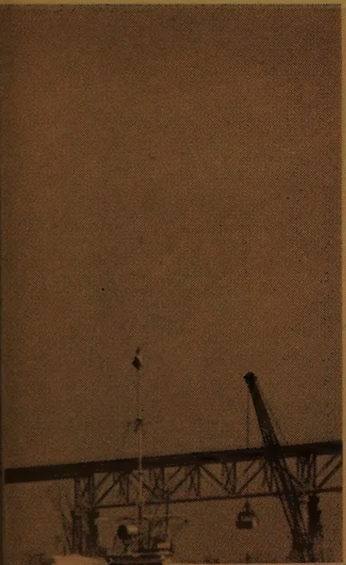
…BER-KING F…
…KING FERT…
…VER…

60 years with the company is the record of Arthur Gayle, President and General Manager of the entire Kelly-Weber organization. He maintains a special interest in operations of the fertilizer division.

Best selling grades . . . such as 5-20-20, 10-20-10, and 12-12-12 for rice . . . are formulated with International's Triple Super. The Westlake plant formulates 15 different grades of fertilizer.

A GROWING MARKET"

"And International's Charter Carports of Triple help us use our 'water life-line' to best advantage"



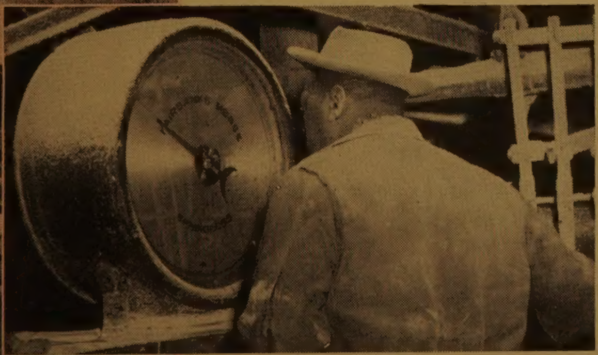
For some 32 years, the Kelly-Weber plant at Westlake, La., has been making use of their Lake Charles "water life-line."

"We get our Triple by carport from International (at Tampa, Fla.)," says Plant Manager Damon Robinson. "Their regular carport shipments help us meet peak season schedules . . . no worry about unloading or handling, either."

The Westlake plant is closely related to the ship channel that connects Lake Charles and the Gulf of Mexico. Construction of both was completed in 1926 . . . and the first ocean-going vessel to use the channel carried a load of fertilizer.

In those early days, Arthur Gayle managed the fertilizer division. Together with his son, W. Gedge Gayle, and Damon Robinson, he developed a growing market for Weber-King brand fertilizers. An acidulation plant was built in 1944 . . . a granulation unit installed in 1954. International's Triple Super is an important ingredient in the high-analysis, granular fertilizers their farm customers require.

If you're not already using International's Triple Super investigate now. Learn how you too can benefit from International's superior quality triple . . . guaranteed minimum 46% APA . . . and service tailored to meet your requirements. Write or wire your International man for full details.



Basic goods are weighed into batch hoppers by Cleveland McCraney. In addition to operations at the Westlake plant, non-nitrogenous grades are produced in plants at Lake Charles and Eunice, La.

Strong demand for Weber-King fertilizers carries over from planting season into top-dressing, then fall pasture seasons. Sales area covers southwestern Louisiana and southeastern Texas.

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No other process begins to compare with *way-ahead* Sackett SUPER FLO in making normal, fortified and triple superphosphates of premium quality at *way lower* cost.

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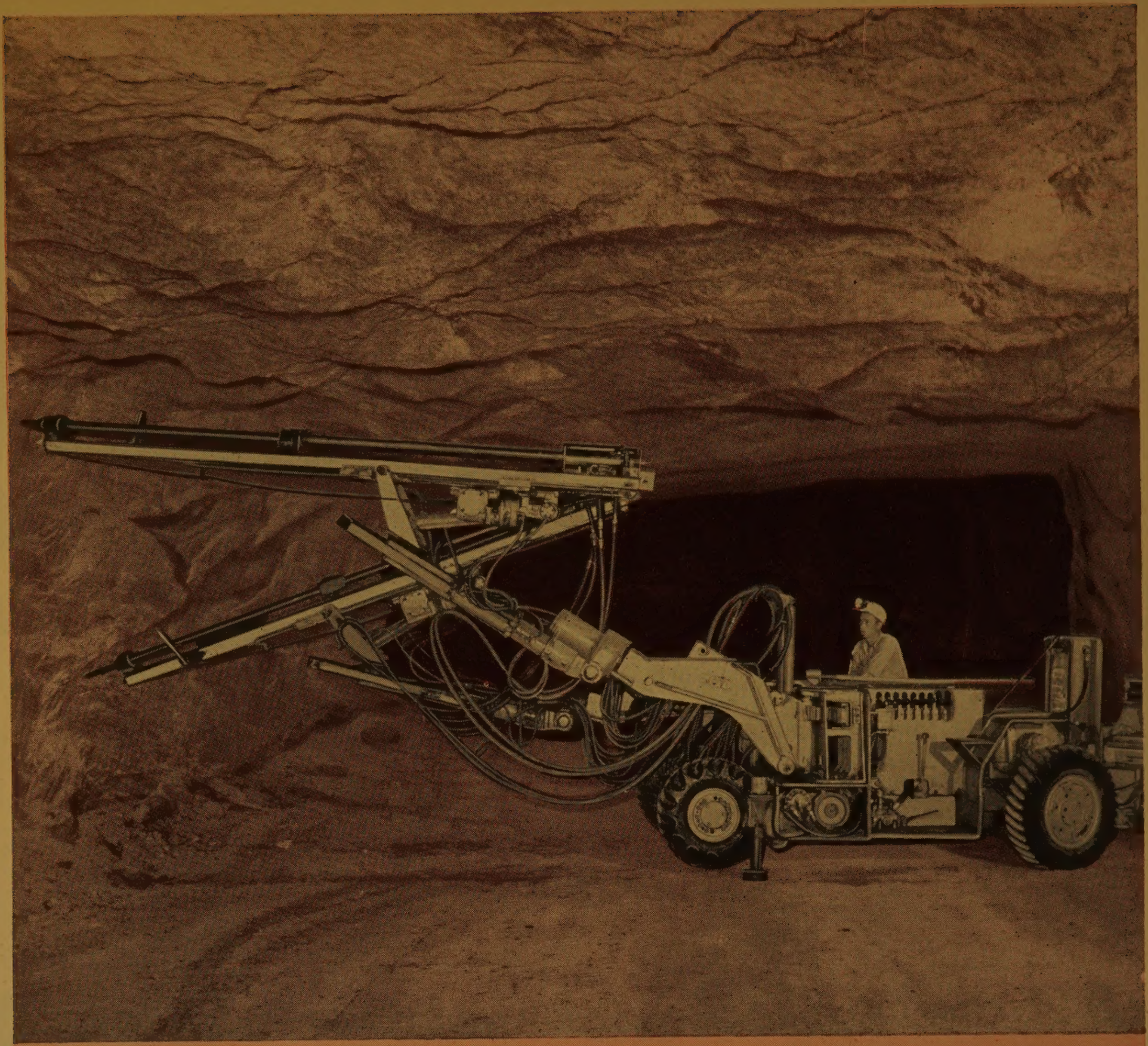

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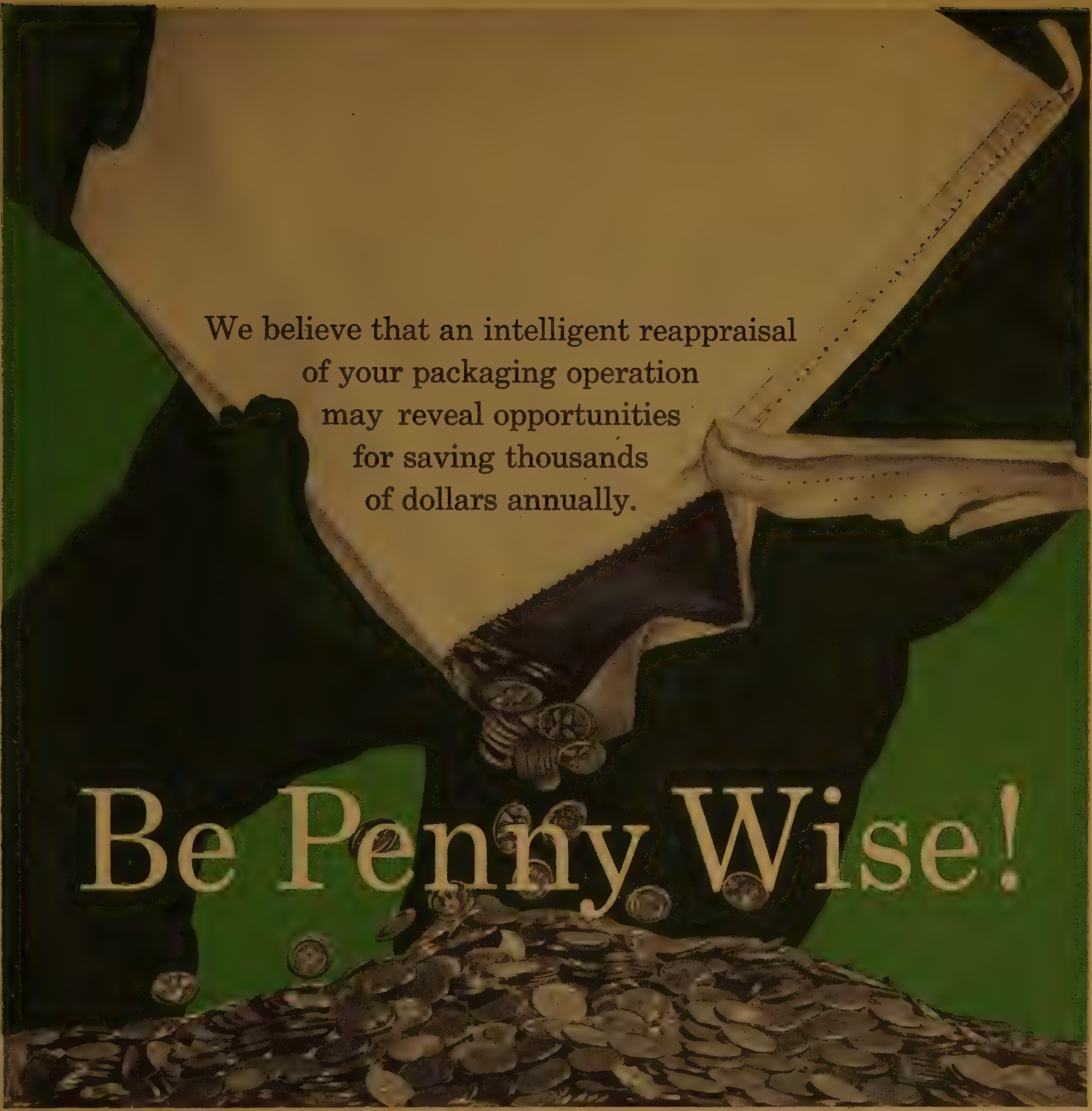

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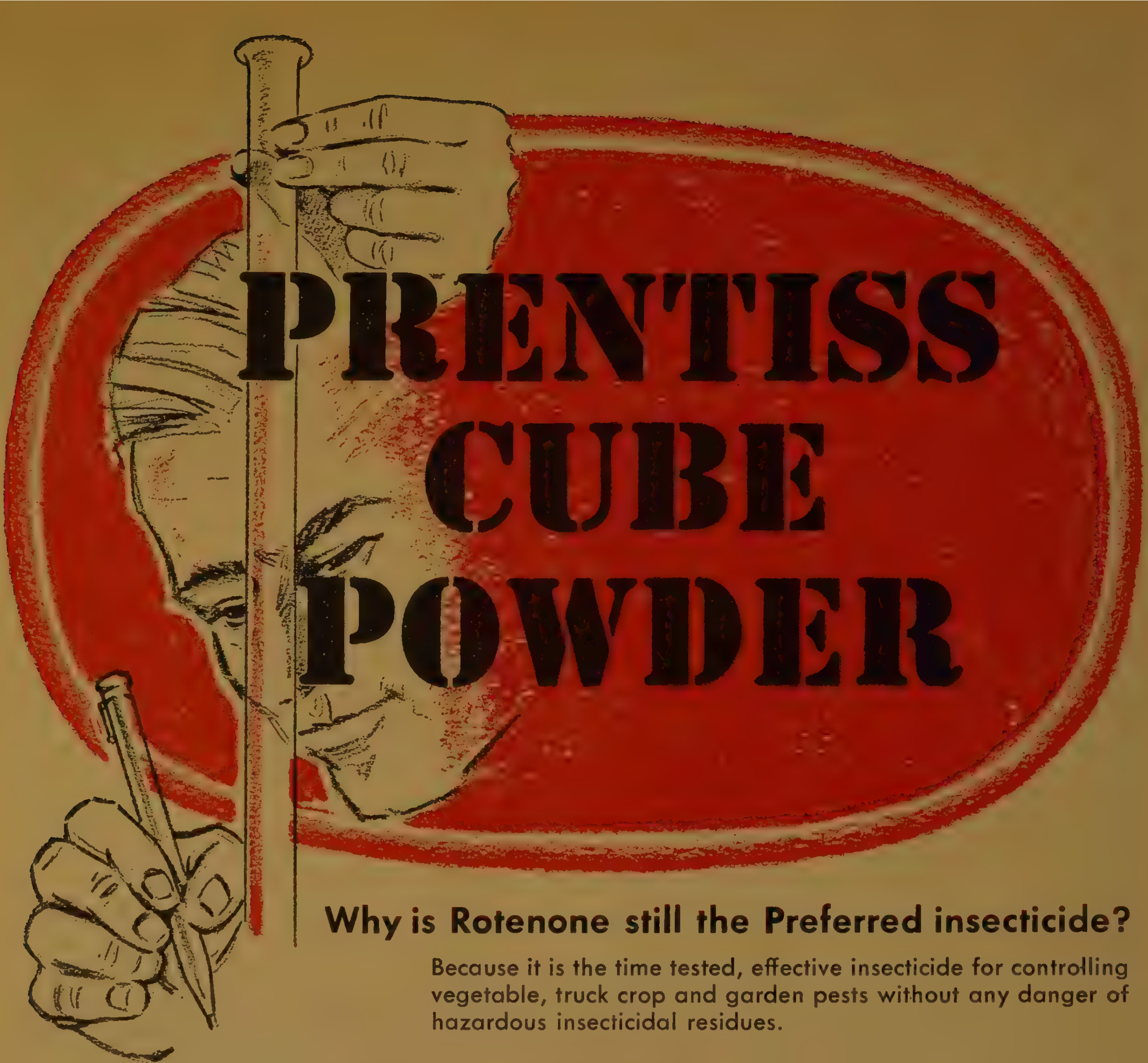

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Because it is the time tested, effective insecticide for controlling vegetable, truck crop and garden pests without any danger of hazardous insecticidal residues.

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Because **Prentox Cube is the bonus product.** Every 5,000 pounds is batch blended and analyzed for Rotenone content to guarantee the insecticide manufacturers a genuinely standardized Rotenone Powder.

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- DDT
- Chlordane

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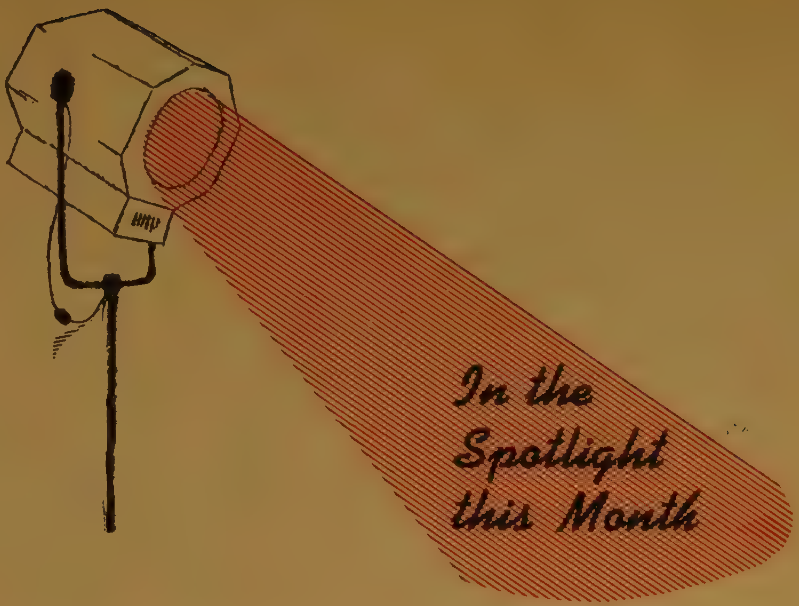
Industry Meeting Calendar

June 9-11—Association of Southern Feed and Fertilizer Control Officials. Heart of Atlanta Hotel, Atlanta, Ga.
July 13-16—Northeast Branch of the American Society of Agronomy, Cornell University, Ithaca, N. Y.
June 15-18—National Plant Food Institute, Greenbrier Hotel, White Sulphur Springs, W. Va.
June 25-27—Pacific Branch, Entomological Society of America, San Diego, Calif.
July 8-10—Pacific Northwest Plant Food Association, Regional Fertilizer Conf., Pocatello, Idaho.
July 18-19 — Southwest Fertilizer Conference and Grade Hearing, Buccaneer Hotel, Galveston, Tex.
July 30 — Kentucky Fertilizer Conference, Greenville, Ky.
Aug. 4—Annual Meeting, National Joint Committee of Fertilizer Application held in conjunction with American Society of Agronomy, Purdue University, Lafayette, Ind.
Aug. 10-14—29th Annual Meeting, Rocky Mountain Conference of Entomologists, Cameron Pass 4-H Club Camp, Gould, Colorado.
Oct. 14-15 — Western Agricultural Chemicals Association Annual Meeting, Villa Hotel, San Mateo, Calif.
Oct. 22-24—Pacific Northwest Plant Food Assn., Gearhart, Oregon.
Oct. 28-29—Northwest Garden Supply Trade Show sponsored by the Oregon Feed and Seed Dealers Assn., Portland, Oregon.
Oct. 29-31 — Fertilizer Industry Round Table, Park Sheraton Hotel, Washington, D. C.
Oct. 29-31 — National Agricultural Chemicals Association Bon Aire Hotel, Augusta, Ga.
Oct. 29-31 — Eighth annual meeting of the Entomological Society of Canada and the 95th annual meeting of the Entomological Society of Ontario, Guelph, Ontario.
Nov. 9-10 — California Fertilizer Assn. 35th Annual Convention, Ambassador Hotel, Los Angeles.
Nov. 24-25—Eastern Branch, Entomological Society of America, Lord Baltimore Hotel, Baltimore.
Dec. 1-4—Entomological Society of America, Sixth Annual Meeting, Hotel Utah, Salt Lake City, Utah.
Dec. 3-4—North Central Weed Control Conference, Netherland Hilton Hotel, Cincinnati.
Dec. 9-11—Chemical Specialties Manufacturers Assn., Sixth Annual Meeting, Commodore Hotel, New York.
Dec. 17-18 — Beltwide Cotton Production Conf., Rice Hotel, Houston, Texas.
Dec. 26-30—American Association for the Advancement of Science, 125th Annual Meeting, Washington, D. C.


amp
In the Spotlight this Month

- **Potash Sizes** . . . Short cuts to granulation by using coarse potash indiscriminately may result in segregation. Practical results of using coarse and fine potash are reported in a symposium of experts in fertilizer manufacture. Page 28.

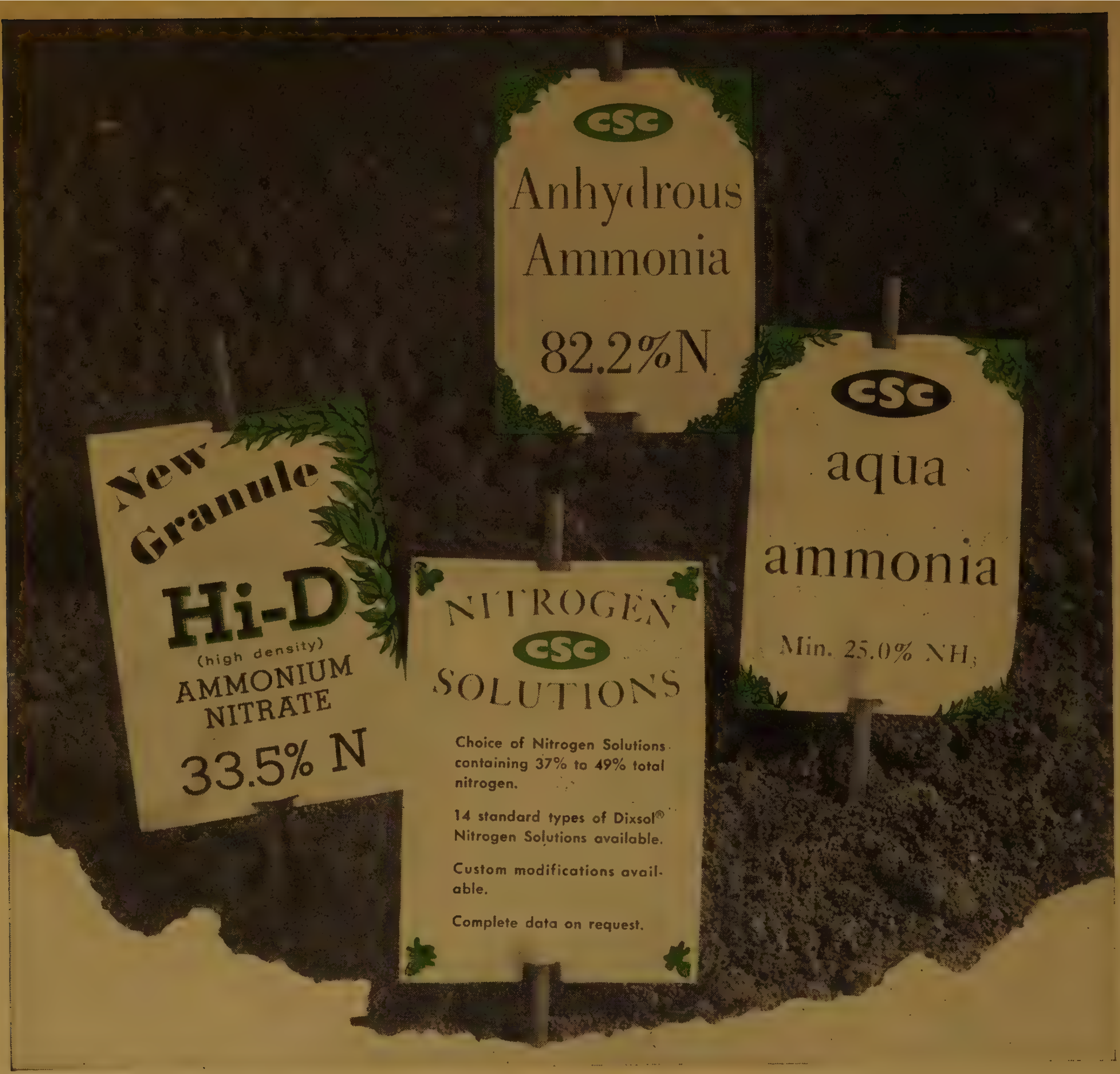
- **Surfactants for Insecticides** . . . Just as suitable solvents or agents for formulation must be chosen specifically for a given pesticide, so must a specific surfactant be selected for a pesticide. Page 31.

- **Pesticide Outlook** . . . In spite of a national business recession, the market outlook for agricultural pesticides appears to be quite promising for 1958, with sales anticipated somewhat higher than last year. A survey of comments by industry representatives on the 1958 market outlook is reported in this issue. Page 34.

- **Forest Fertilization** . . . Research is continuing into the prospect of increasing the productivity of our forests through the use of fertilizers; this report summarizes the most recent experiments being carried on both in the U. S. and abroad. Page 40.

- **The Custom Applicator** . . . This second installment of a new section features a review of methods, pesticides and equipment for pest control in alfalfa in the northwestern states. Of interest to the aerial applicator is a discussion of Aircraft for application of herbicides in control of chamise and associated brush species. Page 55, 57.

- **Care of Sprayers** . . . Tank inspection, avoiding corrosion, preparation for storage, among maintenance practices for spraying equipment. Page 50.



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heart
of the
harvest

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now released as a selective herbicide for corn

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Over 400 research cooperators nationwide have tested this outstanding herbicide. Results show that the application of Simazine 50W at 4 pounds per acre, on normal soil, virtually eliminates grasses and broadleaf weeds from corn for the entire growing season.

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- manganese sulphate (Tecmangam)
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VEGETABLES	broccoli Brussels sprouts cabbage cauliflower		collards corn kale lettuce	peas pea vines potatoes mustard greens	spinach tomatoes turnips turnip tops
FIELD and FORAGE		alfalfa		clover	sorghums

FOLIAGE-DESTROYING INSECTS	aphids mites cabbage loopers corn earworms	cutworms false chinch bugs grasshoppers dipterous leafminers imported cabbageworms	lygus bugs leaf hoppers red-banded leaf rollers salt-marsh caterpillars strawberry leaf rollers

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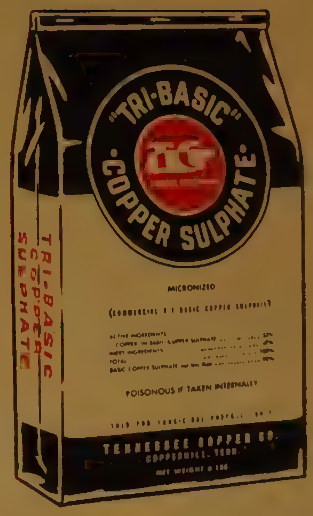

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- Easy to Apply
- Economical
- Upgrades Quality of Fruits & Vegetables
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- Corrects Copper Deficiencies
- Effective Control
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You get so many more advantages with Copper fungicides—used as a spray or dust on practically all truck crops in the control of persistent fungus diseases — Tri-Basic provides control of citrus and grape diseases, also on many deciduous fruits—Tri-Basic has excellent adherence qualities and protects longer — lower disease control cost, greater yield of top quality produce.

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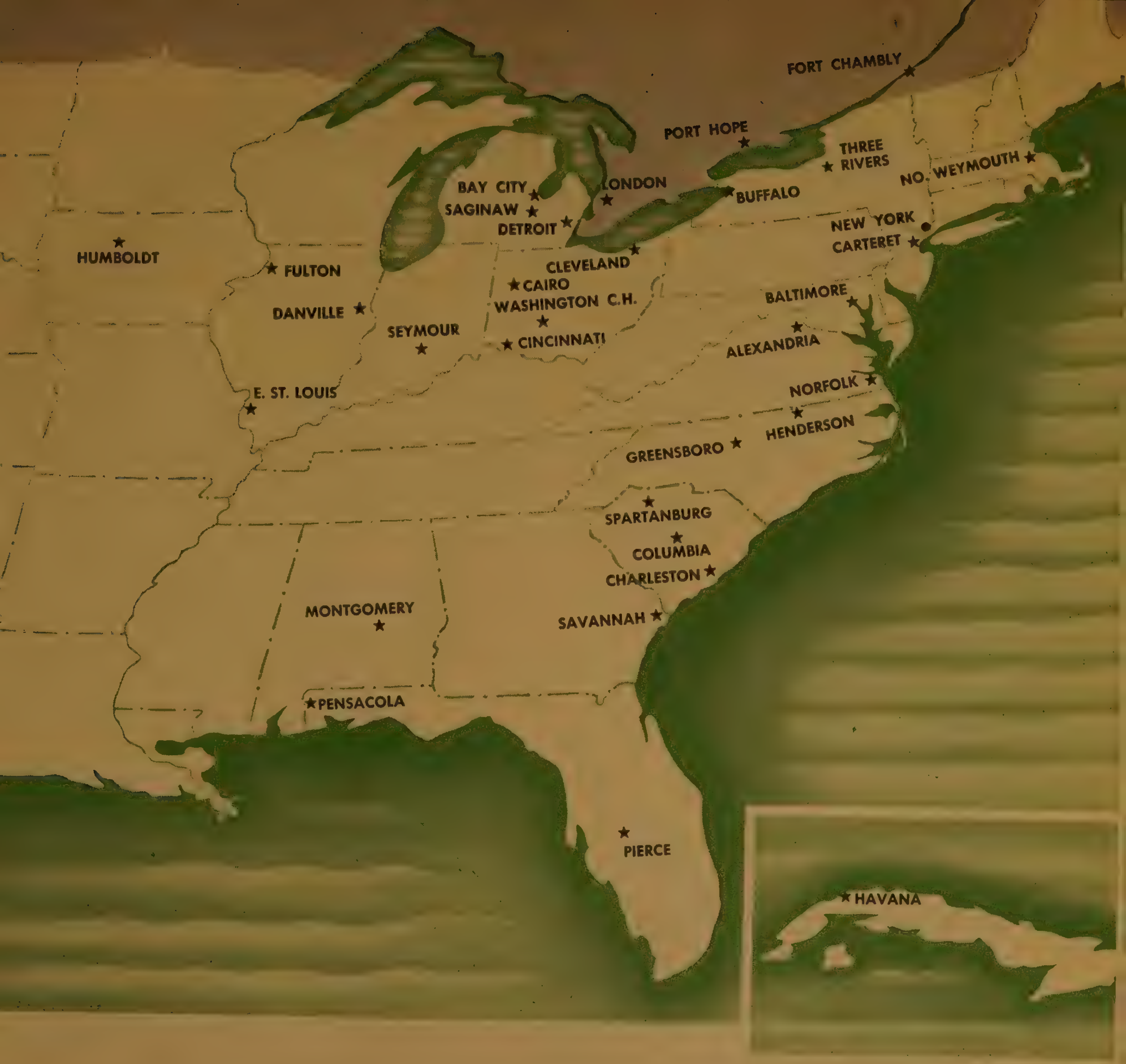

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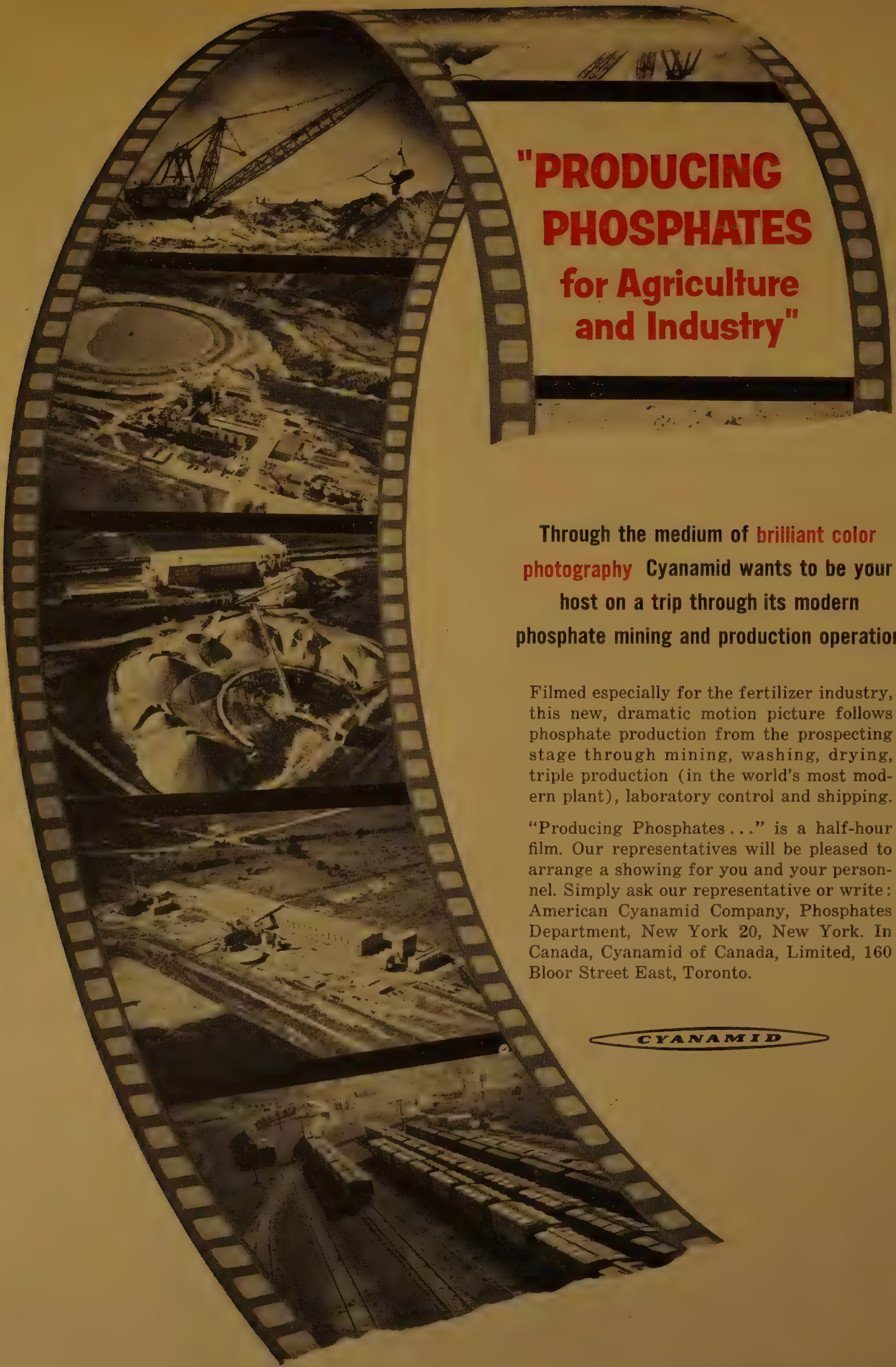

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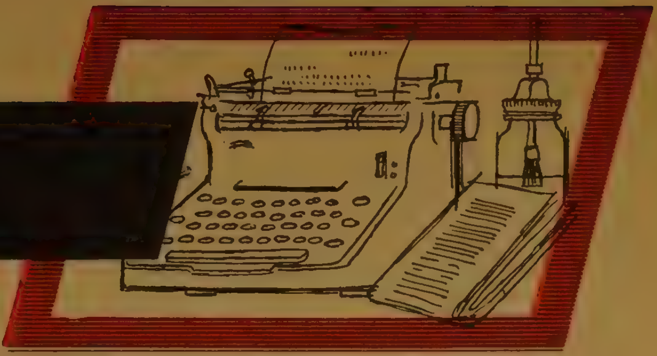
EDITORIALS



IN spite of late spring freezes, followed by excessive rainfall in many areas, 1958 still promises to be quite a good year for pesticide sales. Reports received from important agricultural areas are summarized elsewhere in this issue (pp. 35-39). They indicate that the Florida market was wrecked during February and March by the unseasonal freezing weather, but that agriculture has snapped back in the state, under the stimulus of favorable growing conditions during the late spring, and pesticide sales have staged a good recovery. Growers have shown a disposition to make free use of pesticidal aids to safeguard crops which escaped the earlier freezes.

Cotton planting has been seriously delayed by continuing rains in some parts of the Cotton Belt, and in the delta area many farmers are still finding it impossible to get into their fields because of local flooding. Pest infestations are reported at threateningly high levels in many areas, however, and when a crop is finally planted and comes to maturity there is a strong prospect that demand for pesticides will be heavy. Best informed opinion suggests that while pesticide demand will be late in materializing this season, it may still add up to impressive totals before the season is over.

There are a number of factors which seem to be acting to expand the pesticide business. The growth of the home garden market is one factor on the positive side. Still another is the educational programs that have been conducted among pesticide users by some major suppliers of basic toxicants. They have attempted to educate the farmer to the fact that it is possible for him to solve his insect problem if he acts early enough in the season, before infestations mount to unmanageable proportions. Fair headway has been made in getting this message across.

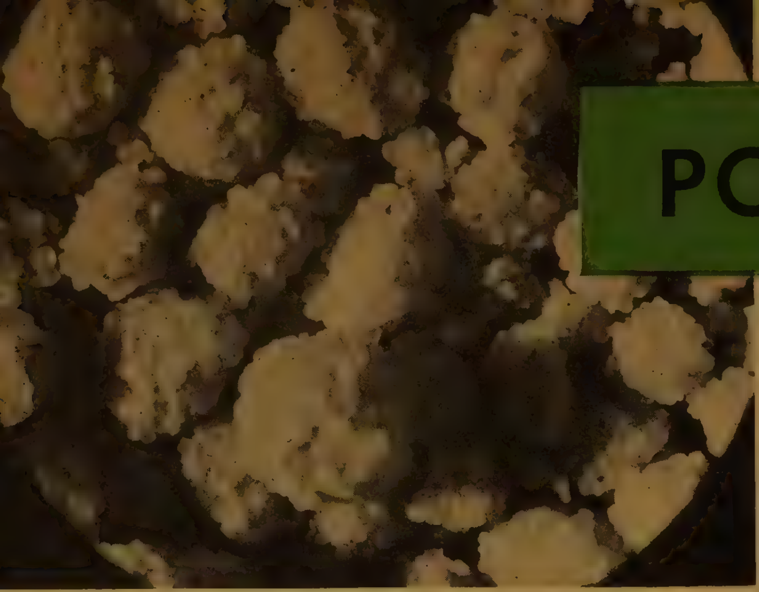
Finally, there are quite a number of promising new pesticides that have been brought to market over the past year or two. In many cases they are products designed to do a specific job which previous general line products did not handle as well. The efficiency of the new products has extended old markets and established new ones. Those firms that have done an intelligent job in introducing these new pesticides, educating the farmer in their use, and merchandising them intelligently, are reporting good sales figures in spite of adverse weather.

If your own sales are below par, perhaps the stimulation of new product lines and more aggressive merchandising may be what is needed.

A CONTINUATION of trends previously noted in fertilizer sales is evident from analysis of the 1957 Fertilizer Consumption Report which will be released by U.S.D.A. in final form in another few weeks. Total consumption of all fertilizers is up moderately, with a fairly substantial gain of 4% in use of primary plant nutrients. Average analysis of mixed goods again registers a gain. Nitrogen scores the most striking increase in use, as American farmers continue to soak up increasing quantities of anhydrous ammonia, urea and nitrogen solutions. The boom in liquid fertilizers continues.

After a brief interruption over the past two or three seasons, in the steady climb in fertilizer sales, which had been apparent since the early 40's, fertilizer manufacturers should now, we

(*Continued on Page* 117)



POTASH Sizes

This review on optimum mesh size of potash for granulation and blending with other coarse materials was presented at the Fertilizer Industry Round Table meeting in Washington, D.C., November 6-8, 1957. The discussion is offered in two parts, with the concluding section scheduled for the July issue of *Agricultural Chemicals.*

Introduction

By R. D. Tayloe

National Potash Co. New York City

POTASH is currently available in three sizes, granular, coarse and standard. These fall more or less in the following ranges, 6 to 14 mesh, 10-28 mesh and minus 28 mesh. These are approximate, as each manufacturer works in a slightly different range. The standard grade exhibits the widest variation, some products being almost all plus 50 mesh and others being less than 50% plus 50 mesh.

There are four general uses for potash; side-dressing, plow-down, blending and mixing. By side-dressing I mean to a growing crop. Here the granular material is required, so the potash will fall to the ground and not damage the growing plant.

Material for plow-down is put on broadcast prior to plowing; for this purpose the finer grades do better as better distribution can be obtained.

Blending refers to the mixing of dry materials to make such grades as 14-0-14 or 0-20-20. The materials used are generally granular and a large part of this tonnage is bulk-spread. Care should be taken to prevent segregation, and I would suggest a potash the same size or just a hair finer than the other materials.

Mixing to me implies ammoniation, with or without granulation and for the most part sold in bags. The tonnage here outweighs the other uses combined by many times.

For mixing without granulation the standard size potash should be used.

When granulation is involved, the current trend is toward the use of coarse potash as a seeding agent in grades high in potash. Because of several factors coarse potash is not much used in 1-1-1 ratios, but is in 1-4-4's. Since these are two leading ratios, the manufacturer should have two potash bins, using standard as much as possible, with coarse available as needed to granulate high potash grades.

This is not the official sales policy of my company nor, as far as I know, any other potash company. It is my suggestion, based on the facts that (1) there is more standard available, (2) it is cheaper and (3) it gives a more homogeneous product.

There is not a great deal of data available on the effect of potash particle size. Some work by the TVA was reported at the ACS meeting in 1957, and I have seen other data. They all find that increasing the potash particle sizes increases the yield of on-size product. The homogeneity of the product is bound to be affected, however, as the lower size limit is raised. Mr. Hardesty* at the Round Table last year gave 10-mesh as about the upper limit for good granulating practice, and as I recall suggested about 30 mesh as the lower limit, which permits the inclusion of potash coated with ammoniataed super in the entire product size range.

I would say that more data are needed on the subject, with particular emphasis on the homogeneity of the product and the potentiality of segregation. In closing, let me leave this thought: blend coarse and standard for use as needed, using the highest proportion of standard consistent with good operation rather than going for the maximum yield of on-size product at the first pass.

---

*John Hardesty, USDA, Washington, D.C.

Practical Results, Using Coarse and Fine Potash

By Albert Spillman,

Fertilizer Manufacturing Coop., Inc., Baltimore, Maryland

I WANT to go on record that I do not advocate using coarse potash. I hope some day, through more research, we will find the answers, possibly by using an additive material or with some changes in our equipment, to granulate low nitrogen-high potash mixtures without the use of coarse potash. But, until that information is a reality, I don't believe we have any other recourse, if we are to keep operating, except to use coarse potash in our low nitrogen-high potash mixtures.

In most of our high nitrogen granular formulas we have sufficient soluble salts to enable good production of on-size granule recovery and can hold down our recycle of fines to a minimum. Using the fine standard potash passing 85-90% thru 35 mesh is no problem in these mixtures. Product recovery —5 mesh + 20 mesh, before screen classification, averages 65 to 80%. This is a good recovery in our particular installation at Baltimore and keeps us operating on full plant scale. Our low nitrogen-high potash granular mixtures, carrying insufficient soluble salts, are difficult to produce. Using the fine standard potash in these mixtures produces a low product recovery averaging 45-50% on-size before screen classification. Coarse potash used here is very helpful to produce sufficient on-size product recovery to permit good operating conditions.

We use coarse potash in our low nitrogen-high potash granular mixtures 6-12-12, 6-12-18 and 6-18-18. With fine potash in these mixtures we obtain a product recovery —5 mesh + 20 mesh of approximately 45-50% compared with recovery on-size of 65-80% when we use coarse potash. Using coarse potash is very tempting from an operator's standpoint and a real utopia for him to keep production of granulation to maximum capacity of his rated granulating equipment. However, we must be careful not to use coarse potash in formulating mixtures if there is the slightest chance regular standard fine potash can do the job. As mentioned earlier, for the present, until other equipment or means of formulation are found to granulate difficult low nitrogen potash formulas, I can see no alternative to using coarse potash.

To enable more uniform distribution of potash, into all the range of particle sizes of the complete mixture, obviously best results can be obtained when using the standard fine potash passing approximately 85% thru 35 mesh and particle size finer than 65% held down to a minimum. For mixtures difficult to granulate, where coarse potash is used, I recommend using particle size with a minimum + 10 mesh, or it can be obtained, all through a ten mesh and a minimum of finer than 35 mesh. 85-90% —10 + 35 with approximately 60-70% —10 + 20. I believe this type of coarse potash will do a fair job and will hold down the extent of segregation.

Careful experiments made by us on plant production scale conform with the findings of experimental work reported by John Hardesty, U.S.D.A. Analyzing mixtures containing coarse potash by fractions shows that 5 and 10 mesh size carry a high potash content and 20 mesh size carries a low potash content. However, the complete mixtures show the potash to grade as guaranteed. To do some testing at our plant we ran two separate tests on two grades of coarse potash. Screen percentages by fractions were as shown in Table 1.

Potash Symposium Participants
PART 1
R. D. Tayloe
National Potash Co., New York
Albert Spillman
Fertilizer Mfg. Coop, Baltimore
T. J. Bosman
Federal Chemical Co., Nashville
Edwin Kapusta
U.S. Potash Co., New York
PART 2—NEXT MONTH
J. G. MacArthur
Spencer Chemical Co., Kansas
John Hardesty
USDA, Washington, D.C.

We had about 10% more recovery of on-size product using #1 grade potash, which was coarser than the #2 grade potash. However, we had better potash analyses with the #2 grade potash carrying a bigger spread of particle size between 10 and 35 mesh.

Recovery of product before recycling is shown in Table 2.

Two mixtures, 6-18-18 and 6-12-12, were made with each of the above grades of coarse potash. The mixtures were carefully sampled and analyzed by fractions, 5, 10, 20 mesh and composite, to find out which of the two grades of coarse potash did the best job. Table 3:

I cannot emphasize too strongly the importance of an operator doing a little experimenting in his plant.

Table 1

	10 Mesh	20 Mesh	24 Mesh	35 Mesh	Total on 35
#1 Grade	7.00	74.00	11.00	6.00	98,00
#2 Grade	4.00	52.00	18.00	22.00	96.00

Table 2—Screen Fractions Product and Potash Analyses

Formula	5 Mesh	10 Mesh	20 Mesh	Composit	Potash Used
6-18-18 Granular	21.40%	19.60%	16.55%	18.24%	#1 Grade
6-18-18 Granular	20.90%	19.42%	16.40%	18.06%	#1 Grade
6-18-18 Granular	19.32%	18.70%	17.50%	17.98%	#2 Grade
6-18-18 Granular	19.15%	18.58%	17.32%	18.05%	#2 Grade
6-12-12 Granular	13.95%	13.20%	11.40%	12.22%	#1 Grade
6-12-12 Granular	13.88%	13.42%	10.95%	12.15%	#1 Grade
6-12-12 Granular	13.65%	12.95%	11.34%	11.98%	#2 Grade
6-12-12 Granular	13.15%	13.04%	11.20%	12.05%	#2 Grade

Table 3

6-18-18 Granular	81%	#1 Grade Potash
6-18-18 Granular	78%	#1 Grade Potash
6-18-18 Granular	70%	#2 Grade Potash
6-18-18 Granular	72%	#2 Grade Potash
6-12-12 Granular	76%	#1 Grade Potash
6-12-12 Granular	73%	#1 Grade Potash
6-12-12 Granular	69%	#2 Grade Potash
6-12-12 Granular	67%	#2 Grade Potash

There are times, I know, we have difficulty getting our operators to try certain formulas which may or may not help for better operating conditions. After all, they are expected to produce tonnage and if they do not get the tonnage they may be told "you just cannot do a job." Sometimes I am afraid we use coarse potash where we could get by with the fine potash. My recommendation is to do a little more fussing in the plant and maybe we can get this coarse potash down to a lower figure.

There are a number of different types of coarse potash on the market today, and it is very important that the mixer know what he is using. In a survey of coarse potash, made in our own plant a short time ago, I found about 15 different samples of coarse potash in which the range of 10 mesh fractions varied from as low as 2% to 52%. This variation is startling and should arouse some concern. A good many experienced operators know what they are doing and will order the types of potash best suitable for their operating conditions. I am afraid a lot of small mixers and some inexperienced operators who are using coarse potash may experience a lot of difficulty with segregation if they are not cautioned on the type of coarse potash to use. Most of us granulating are screening our final product thru +5 to +6 mesh and —20 to —28 mesh. I am sure all of the potash producers understand our problem of possible segregation when the percentage of + 10 mesh coarse potash used is on the high side. The potash producers of coarse or granular potash have already done an outstanding job to produce the type of coarse potash we need for mixing.

My recommendation, based on what I have been able to find out, is that if we are going to use coarse potash, let's get it as much thru 10 mesh as possible, 100% would be ideal. However, to be practical from a cost standpoint, 85-95% —10 + 35 mesh (about 60-70% on 20 mesh) is workable. For best operating conditions standard fine potash should screen 85-95% thru 35 mesh with a minimum of —65 mesh.★★

Results of Tests Using Potash of Different Particle Size In Granulating 5-20-20

By T. J. Bosman
Federal Chemical Co. Nashville, Tenn.

THE data in this report were obtained from test runs at the Federal Chemical Company, Danville, Illinois Plant. The work was under the direction of Dr. Ed. C. Kapusta and myself. It was a follow-up to previous work done by Dr. Kapusta at Kingsbury & Company and the Buhner Fertilizer Works. My results are very much in line with the work done in these previous tests.

Four runs were made. On runs #1, #2, and #3, three samples were taken at the granulator, dryer-cooler, recycle belt and finished product belt respectively. The first was taken one half hour after getting on stream, the other two at one half hour intervals from the first. On run #4, only one set of samples was taken after being on stream one half hour, as all storage space was full and we had to stop batching. This gave us 16 samples on which screen tests and the analyses of each cut were made, in addition to the screen test on raw materials. We condensed these results by taking weighed averages of all samples from each source in the same run.

From the data obtained I sum up the results as follows. With the coarse potash, less recycle is formed, thereby cutting down on the quantity of acid and water needed for granulation. However, the coarse potash tends to greater variations in analyses. You can pick separate particles of this coarse potash adhering to the other granules.

The fine potash makes more recycle, thereby causing the use of increased quantities of water and acid. The analyses are slightly more uniform, but still leave a lot to be desired. You are not able to distinguish the potash from the other granules in the finished product as readily as with the coarse material.

On both days, these tests ran about as ideal as a 5-20-20 granulation could. The quantity of water was the lowest we have ever been able to use and get granulation. Most of the time we have had to bypass our instrument to get enough water for granulation. On a 30-ton per hour basis this would be over 166#'s water per ton. How much over, is hard to estimate.

Once, before we had a pump put on our water line, Dr. Kapusta and I had to postpone our test because we couldn't get enough water for granulation using the coarse potash, even though we were using considerably more than we used in any of the runs reported in this paper.

This follows much in line with other work done by Dr. Kapusta. At one place he had to use 180# H_2SO_4 and from 258# to 363# of water per ton to get granulation.★

Further Comments

By Edwin C. Kapusta
U.S. Potash Co., New York

PLANT experience has indicated the important role of potash particle size in the granulation of low nitrogen-high potash grades in this process. To obtain maximum production rates and reduce problems in plant operation, manufacturers have resorted to the use of granular potash in the production of these grades. Since little plant scale data was available as to the optimum potash particle size for this application, arrangements were made to conduct plant scale tests which might provide more information on the effect of potash particle size on granulation.

Plant scale tests on the effect of potash particle size on granulation of 5-20-20 fertilizer were carried out at the Buhner Fertilizer Company plant at Danville, Illinois. This plant employs the TVA continuous ammoniator process.

Three sizes of granular muriate of potash were studied in these tests.

(Continued on Page 125)

Use of SURFACTANTS with Agricultural Chemicals

by Virgil Freed

Oregon State College

THE watchword of today's agriculture is efficiency. Efficiency is required not only of the machinery and fertilizers used in agriculture but the chemicals used for pest control as well.

To achieve maximum efficiency with modern pest control chemicals, the use of a surfactant is vital.

Surfactants are used widely with most of the agricultural pesticides today. However, of all the chemicals utilized by the agriculturist, the surfactant and its role is probably the least understood. It is not generally appreciated that this branch of agricultural chemicals is an important adjunct not only to pesticide formulation but to the effectiveness of the pesticides in the field. There is a widely held assumption that any substance that will lower the surface tension of water or increase its wettability, will serve as a surfactant for any pesticide. Nothing could be further from the truth than this.

Just as suitable solvents or other agents for formulation must be chosen specifically for a given pesticide, so must a specific surfactant be chosen for a pesticide. The problem goes further than this, however. Not only must the surfactant be chosen to suit the pesticide, but it must also be chosen to fit the particular problem for which the pesticide is to be used. For example, one surfactant may be very suitable to be used with 2,4-D for the control of weeds but be totally unfitted for use with an organic phosphate insecticide. In the one case, it is desired to achieve maximum penetration into the plant; in the other case, one wants a good surface deposit of the pesticide.

With these thoughts in mind, the question naturally arises—Just what are surfactants? Surfactants, the name derived from surface-active agent, are chemicals that reduce the surface tension of water or increase its wettability. They come in a wide variety of types and each is designed for a particular use. For example, one type of surfactant may be very effective as an emulsifier for oil, usually for a particular type of oil. Still another surfactant agent will have cleansing properties, while another has the ability to increase wetting and penetration. For simplicity's sake, chemists have chosen to classify the surface active agents into three broad groups depending upon the chemical characteristics of the material. These three groups are the so-called cationic, anionic, and non-ionic. For the most part, the anionic-type surfactant is most familiar, because it is commonly encountered as a detergent used in the household, in the form of cleansing agents. A mixture of non-ionic surfactant coupled with the anionic surfactant is frequently encountered as an emulsifying agent, and the cationic surfactant is more frequently used in germicidal preparations. For the most part, surfactants are characterized chemically as possessing both a fairly large oil soluble group in its molecule and a water soluble group. The uniting of both oil soluble and water soluble properties in the same molecule causes these materials to align themselves in certain ways at the surface of water. This causes a reduction in the surface tension of water. It also accounts for the ability of these substances to emulsify oil in water, since the oil soluble portion of the molecule tends to associate itself with the oil while the water loving portion of the molecule extends out into the water phase.

At this point, it is quite natural to think that if this whole business is as simple as that, why isn't one surfactant just as good as another? The point to the story is that it isn"t quite so simple. In the dyeing as well as in the washing of fabrics, the speed and thoroughness of the wetting of the fabric is very important. It was learned early in wetting studies that not all surfactants were equally good for wetting fabrics. In investigating this problem, chemists soon discovered that the mere lowering of surface tension does not assure good wetting. There is some peculiarity about certain surfactants that causes rapid and thorough wetting, even though they do not reduce the surface tension of water as much as certain other surfactants. This observation has long been the basis of the so-called Draves test in textile work.

The difference in a surfactant's ability to wet fiber is an indication of how well the molecules of the surfactant are able to line up along the surface of the fiber. The same principle applies in wetting the surface of a plant. Not all surfactants are equally able to wet a plant's surface, although they may reduce the surface tension by a comparable amount. Their ability to wet a plant's surface depends on how well the molecules can attach themselves to the plant surface itself. Now, when a pesticide is added to a mixture of water and surfactant, the characteristics are altered. Therefore, it is necessary to choose a surfactant that is particularly compatible with the pesticide in question, so that the resulting mixture will offer adequate wetting of the leaf surface.

Not only do the pesticide and surfactants influence each other, but a third factor is to be considered:—the plant wax or cuticle, Studies indicate that penetrating qualities of what appear to be similar surfactants may vary considerably. In a comparison of two materials that may lower the surface tension of water equally, and also web a plant surface equally, it may be found one surfactant is penetrating the cuticle and getting into the openings of the plant surface much better than the other. This particular surfactant would probably be a very good one to bring about the penetration and translocation of a systemic material. On the other hand, the other surfactant which tends to remain at the plant surface may be much more effective for use with a pesticide that should remain on the leaf surface for most effective use.

Experience has demonstrated repeatedly that not only does the correct surfactant improve the effectiveness of

(*Continued on Page* 121)

NATIONAL PLANT FOOD INSTITUTE

June 15-18, 1958

Greenbrier Hotel, White Sulphur Springs, W. Va.

PROGRAM

June 15-Sunday

Registration

Meeting of the Executive Committee and Board of Directors

June 16-Monday

Panel Discussion — "Changing Farmers' Attitudes Toward Fertilizer"
"Farmers' Present Attitudes," — M. S. Williams, chief agricultural economist of the NPFI
"What Can State Agricultural Colleges Do?"—Webster Pendergrass, dean, College of Agriculture, University of Tennessee
"What Can Industry Do?"—W. E. McGuirk, chairman, National Plant Food Institute Special Study Committee

Panel—"What is the National Plant Food Institute Doing"
Introduction—W. R. Allstetter, NPFI vice president
Regional Reports by NPFI representatives:

Western District Representative—Richard B. Bahme

Midwest Regional Director—Zenas H. Beers

Southeast Regional Director—Samuel L. Tisdale

Southwest Regional Director—Robert L. Beacher

Northeast Regional Director—Willard H. Garman

Pacific Northwest District Representative—F. Todd Tremblay

Business Session

Panel—"Changing Farmer's Fertilizer Practices" — A. H. Bowers, Chairman and moderator
"The Dealers View"—Orville Buerge, Buerge Brothers, Harrisonville,, Mo.
"The County Agent's View"—J. W. Clark, Dane County Wisconsin Agricultural Agent.
"The Banker's View"—Harry Rash, First National Bank, Kans.

June 17-Tuesday

Films—"The Salesman"—a *Fortune* film production
"Watching Fertilizer Work" a time-lapse film presentation by John Ott, Winnetka, Ill.

Banquet

NPFI at the Greenbrier

FERTILIZER manufacturers, government representatives, industry suppliers, etc. are expected to swell the attendance at the annual meeting of the National Plant Food Institute to more than 1000. The convention will be held as usual at the Greenbrier Hotel, White Sulphur Springs, W. Va., June 15-18. Fred C. Scribner, Jr., Under-Secretary of Treasury, will be the featured guest speaker on Tuesday, June 17th, and discuss "The National Economy — Today and Tomorrow."

John A. Miller, president of NPFI, will preside at the convention sessions, which this year feature two panel discussions:

Changing Farmers' Attitudes Toward Fertilizer.

Changing Farmers' Fertilizer Practices.

Representatives of the regional offices of NPFI will discuss various factors concerning the farmers' *attitude* toward fertilizer, while industry representatives will comment on the farmers' fertilizer *practices,* and review the: dealer's view, the county agent's view, and the banker's view.

A couple of new films to be shown the final day of the meeting are: a time lapse film on "Watching Fertilizer Work," to be presented by John Ott of John Ott Pictures, Inc., and a production of *Fortune* films on "The Salesman."

Hospitality hours, as in previous years, will be sponsored by the nitrogen producers and by the potash producers. The annual banquet will be held June 17th.

Chairmen of the various committees supervising special events are as follows:

Mr. & Mrs. Clyde T. Marshall, Commercial Solvents Corp., head the Hospitality Committee

Chairman of the Ladies Committee which will arrange the garden party scheduled for June 15, is Mrs. John Miller, Louisville, Ky. This committee also will be responsible for other events for ladies at the convention.

C. B. Clay, Cotton States Fertilizer Co., is chairman of the Memorial Committee. He will present the Memorial Resolution during the general session June 17.

Heading the golf committees are Gene Van Deren, Bluegrass Plant Foods, Inc., who will handle men's golf, and Mrs. W. B. Porterfield, Pelham, N. Y., who will be responsible for ladies' golf.

L. L. Jaquier, Phillips Petroleum Co., will chairman the Tennis Committee.

Chairman of the Horseshoe Pitching Committee is A. A. Schultz, Reading Bone Fertilizer Co.

Dr. M. F. Gribbins, E. I. Du Pont de Nemours & Co., will be in charge of the Skeet Shooting Committee.

The bridge and canasta party on June 16 will be under the direction of Mrs. Jack B. Snyder, Topeka, Kan.

Mrs. E. M. Kolb, Ridgewood, N. J., heads the committee in charge of obtaining prizes for the various events.

THE 1958

The 1958 GLF Pesticide Outlook—

by Michael J. Papai
Soil Building Division
Cooperative G. L. F. Exchange, Inc.

THE 1958 pesticides year appears to us in G.L.F. as a relatively good season for volume with growers in general buying very little ahead of actual needs. This creates problems of inventory control as well as local pricing wars on the part of dealers to capture the market.

The new insecticides, fungicides and herbicides are proving very interesting to growers and we have trouble in some instances in getting enough material to supply the demand. The newer practices such as forage insect control and soil treatments are gradually coming into prominence. When a spectacular insect such as alfalfa weevil or army worm attacks the dairy farmer's crops, it moves him faster toward insecticides than any amount of persuasion by extension people, dealers or chemical manufacturers.

We find that soil fumigants and stimulants are getting to be a more important part of the growers' program. This is due in part to an awareness of the problems that exist and in part to the newer materials which make application much easier and safer.

Fungicides:

Fruit fungicide movement has shown increasing demand for the newer fungicides such as Glyodin and Captan. Thylate looks interesting but has not taken a noticeable share of the market. Sulfur volume is up primarily due to mildew problems. In fact, the sulfur volume is surprising in many respects both for the pastes such as Magnetic 70 and the wettable powders. Ferbam materials show about the same volume as in previous years. In summation, newer fungicides with better properties will take over the market, but old established materials can hold their own where they perform well for specific problems.

On vegetables, the newer fungicides such as the manebs and Dyrene are showing very well. The volume increase here is at the expense of the copper compounds and the nabams.

Insecticides:

Several new insecticides such as Sevin and Guthion are attracting so much attention that it has been impossible to meet the demand. Diazinon, as it is getting more clearance from Food and Drug is finding more uses, and we anticipate it will show a greater increase in volume. Malathion is constantly growing in demand. Methyl parathion and the flowable parathions are showing indications of replacing the standard parathion formulations, although this is not taking place as rapidly as we had thought.

Lead arsenate and rotenone are fast disappearing as insecticides in general use. DDT and TDE volume is leveling off, as is Dieldrin for orchards and potatoes. We are anticipating volume increases in Trithion, Systox and Thiodan. Perthane, by itself, has not proven successful, but in combination with a phosphate seems to do very well.

There is some interest in the 70° oils, but in general the oils are proving less popular for orchard mite controls. Such materials as Genite, Ovex and Kelthane appear to be the coming materials, although there are numerous miticides which are competing for the market, with none, in our opinion, having a clear edge.

Briefly summarizing, it looks like new insecticides are rapidly replacing those which have become standard in the past ten years.

Herbicides:

The herbicide volume has been growing constantly, as growers have become equipped with sprayers for herbicides and knowledge in their use. In fact, herbicide usage has shown the most spectacular increase of any agricultural practice due to the wealth of weed killers introduced in recent years and the fact that hardly any chemical herbicides were used until the last decade. The newer herbicides such as the amino triazoles, Dalapon and Simazine are being very well received by farmers and home owners.

Randox for onion weed control has, in two years, captured most of the market and probably will get even more next year at the expense of chloro IPC and potassium cyanate. Vegadex is finding wide use for vegetables and looks like a product which will continue to find favor with the growers.

Simazine and Dalapon are fitting into the dairy farm areas which offer the greater potential for herbicide usage. The Karmex compounds are fitting into special usage such as weed control in grapes and asparagus and as soil sterilants. There are indications that Urox and Simazine will find soil sterilant usage around the farm along with Karmex and the arsenicals.

The dinitros having special usage for weed control on forage legumes as well as peas, beans and potatoes are not showing much variation in volume from season to season. The use of brush killers on farms has never caught the fancy of farmers, although there is no shortage of brush. 2,4-D compounds continue to show volume increase for corn. MCP volume has remained steady the past few years. In general, there is a trend towards pre-emergence type of weed killers for both vegetables and corn. We see 2,4-D being replaced by newer and better chemicals as the general weed control for corn.

Miscellaneous:

There are a number of compounds which are proving to be quite

(Continued on Page 123)

PESTICIDE OUTLOOK

In spite of a late season . . . due to frost, flooding, etc., the current sales picture for pesticides appears promising. Participating in this symposium are representatives from various sections of the country with first-hand reports on pesticide sales and demand.

'58 Sales Deferred Due to Weather

By S. H. Bear
Niagara Chemical Div., FMC

HISTORY has shown that the pesticide industry business level does not follow that of the national economy. Except for years of crop failure, the demand for pesticides was good during the "thirties." General economic activity has been declining and is forecast to continue at the present or lower levels for some months. Activity in the pesticide industry is not forecast to follow the national trend.

Other factors, such as weather, insect infestation, disease prevalence, farm products price levels and frost damage, have a greater influence on demand for our products than does the national economic condition.

Sales to date in 1958 have been somewhat below sales on the same date a year ago. These sales are considered to be deferred by the late arrival of spring and summer weather, particularly in the southern and central parts of the country. Consumers of agricultural pesticides read the newspapers, listen to the radio and watch TV. No doubt they have been influenced by reports concerning declining industry activity and have delayed buying to some extent. They are buying on a day-to-day requirements basis rather than on a fractional seasonal requirements basis. Dealers and distributors are holding inventories down. It is expected that except for the more complete consumption of on-the-farm inventory, total requirements will be equal to or in excess of 1957 requirements.

Severe freeze damage in Florida destroyed some of the citrus and vegetable crops. Citrus acreage has been reduced. Pesticides not sold to date in the freeze damaged area will not be sold. This business is lost. This freeze damage area business does represent a substantial loss for the area, but is not too significant a fraction of the total domestic market.

Except in Florida, crop conditions are generally good. The peach crop appears promising from Arkansas to Michigan and from Georgia to the Great Lakes. No damage has been reported to date to the apple crop. Cotton planting has been delayed in the Delta due to excessive rains but it will be planted. Soil bank diversion will reduce cotton acreage in the southeast with some effect on pesticide consumption. Pesticide applications were reduced substantially in California for several weeks because of abnormal rains. It is expected that seasonal consumption, however in the area will be normal. Unless there is late damage to the deciduous fruit crop or drought or floods, even a pessimistic view would indicate that total consumption in 1958 will be about equal to 1957 use.

There is no significant change in the type of products and no one new pesticide that is in universal demand. There are many new pesticides in late stages of development or early field trial or in commerce under experimental label sales programs. A few that have been introduced on the market recently appear to be very promising and are attracting considerable attention. These new materials are spread rather broadly through the major segments of the industry so no one company enjoys a monopoly in the limelight of demand. Some of them will contribute to better insect and disease control, lower production costs in agriculture and raise our standard of living.

Delivery — A Sales Factor

by S. Besthoff
Faesy & Besthoff

THIS year, buyers seem to be waiting until the last possible moment to place actual shipping orders. Warehouse space limitations, financial considerations, concern as to consumers' attitude and uncertainty regarding raw material cost have all contributed to this condition. In those areas where the season has already opened, suppliers are deluged with orders specifying immediate and even "sooner" delivery. Important as price is, has been, and always will be, the ability to deliver is now paramount. In an industry as subject to climatic vagaries as ours is, it is very difficult to accurately forecast future conditions or needs.

Based only on now visible factors, it is our opinion that there should be an increasing demand for pesticides, fungicides, herbicides, etc.★★

More Product Promotion Needed

By W. R. Peele

W. R. Peele Company

CONSUMERS of pesticides are ready and eager to buy, but due to confusion many are hesitant in placing their orders. Confusion in the consumer's mind is due to many things . . . confusion as to what chemicals to use for what purpose, confusion as to amount to use and correct timing of application. Consumers need plain, understandable recommendations on the pesticide package.

Another factor in delay in ordering is the pricing policies of which many consumers have learned to take advantage. Through past experience, many a pesticide buyer seems to have learned that the longer he waits to buy his requirements of pesticides, the more money he saves. Early buyers often find they have made a bad buy because manufacturers usually wind up the season with lower prices. Too many consumers have learned that they can buy cheaper if they wait.

Another important reason for reduced volume is that many formulators have been too complacent, and have restricted their lines to products which have been on the market for several years, failing to realize the possibility of new uses for old products, and overall uses for new products. The potential sales volume for new products admittedly entails considerable promotion and hard selling, but we know from past experience, that we profit more from promotion and hard selling than anything else.

After evaluating a new pesticide, if it offers a large volume potential in the area we serve, we start an educational and promotional campaign as soon as possible. This has helped materially in building sales. If we had to depend upon the old pesticides that have been on the market as long as eight to ten years for our total business, we could not show a profit or justify the capital investment to merchandise the old well-known easy-to-sell products alone. Everyone is offering these old, easy-to-sell, well-known products; therefore, bidding for a limited amount of business creates a most competitive market.

Through education, service, and hard selling, we have promoted two new products within the past three years that have developed into substantial volume and have returned a fair profit margin.

Some interesting figures came across my desk only last week "North Carolinians spend approximately fifteen million dollars per year total for pesticides, yet they spent twenty-six million dollars last year for toys." Certainly pesticides should be as important to North Carolinians as toys. Somewhere down the line the promotion and sales of pesticides have been neglected if these statistics are a criterion for the rest of the country.

In my opinion the sale and promotion of pesticides have a very bright future. We are looking for the 1958 season to be our best in history, but we are not being complacent in our efforts to make it the best. We are working harder. We are advertising more. We are putting more emphasis on salesmanship. We are making our products the best we know how. We are striving to make our packaging more attractive. We are striving harder to give more service and we are striving to take advantage of the new uses for pesticides.

Although we have had highly adverse weather conditions for the sale and use of pesticides ever since last November, other factors, perhaps a natural growth in the market—have apparently helped to build consumer demand . .. for our sales today, are running approximately 15% ahead of the same period a year ago.★★

Pesticide Use Up to Protect Crops

By Ray Cooney

Flag Sulphur & Chemical Co.

THE entire nation is well aware by this time of the devastating freezes encountered in Florida earlier this season, which dealt severe blows both to the citrus as well as the vegetable growing areas of our State.

One of our heaviest pesticide markets normally occurs during the period from January through April. It is quite evident that our market for pesticides this year was almost entirely erased for the months of January, February, and part of March. On the surface this would appear to be a catastrophe from the pesticide manufacturers' viewpoint, and it was a severe blow, but the entire story is still to be unfolded. As a result of the freezes, we now have the added incentive of protecting the remaining truck crops, and by adequate spraying and dusting programs protecting the heavy investments that all citrus growers have in their acreage. This has resulted to date in an extremely heavy movement of pesticides and fungicides, which in large measure has afforded pesticide manufacturers an opportunity to recoup much of their early season losses.

We are currently experiencing unusually good weather for growing of crops in our vegetable producing areas and as a result, large acreage, although late, has been planted and is maturing in very fine fashion. Most growers are obtaining good yields as well as good prices for their output.

Citrus growers have, during the past thirty to sixty days, experienced some of the highest returns from the sale of their Valencia oranges that have ever been received in the long history of the Florida industry.

All of this when finally evaluated would lead me, as just one observer, to the conclusion that in spite of the devastating freezes this past winter, Florida agriculture nevertheless still remains an extremely profitable industry. Pesticide manufacturers, can anticipate that 1958 will be a fairly good year. We at Flag look forward to a continuation of the very fine movement of pesticides and other related chemicals which we have come to associate with the ever increasing and expanding agricultural industry in this great State.

Over the first three months of '58 demand was obviously far below normal. By the same token, the latter part of March, April and May should result in a demand for pesticides and related chemicals far in excess of last year, or what we might consider a normal year. The products which are most in demand in citrus, by reason of the freeze, are the fungicides; namely, basic copper sulphate and the complete array of other nutritional materials; such as zinc, maganese, and arsenate of lead. There is also a very heavy demand for miticides primarily for the control of six-spotted mite and red spider.

There are a number of new pesticides that are attracting a great deal of attention in Florida agriculture. Listed, not necessarily in terms of importance, are Chemagro's new fungicide, "Dyrene," which is used in Florida primarily for control of gray-leaf spot on tomatoes, and Chemagro's new systematic cattle spray, "Co-Ral," which has just gained U.S.D.A. registration. Geigy has three fine new materials which look extremely promising also: Diazinon, which has many ornamental insect uses, as well as being an extremely fine chinch bug control material; Chlorobenzilate, which seems to have a tremendous potential for the con-

(*Continued on Page* 123)

Heptachlor for Alfalfa — A New Recommendation in Va.

By J. F. Hanley

Southern States Cooperative, Inc.

TERRITORY serviced by Southern States Cooperative consists of the states of Delaware, Maryland, Virginia, West Virginia, Kentucky and the Eastern part of Tennessee. Our weather has been unpredictable and delayed our season.

From an over-all picture, practically all recommended chemicals have moved from the wholesale level to our agencies (dealers) in quantities comparable with past years. It is rather difficult to determine if these products have moved to the ultimate consumers because of climate conditions.

We have noticed, for instance, in the state of Kentucky an increase, at the consumer level, for methyl bromide. Because of climatic conditions it was difficult to prepare tobacco plant beds. When it was possible to get onto the field, there was a need for a product which did not have a long waiting period from time of application to time of planting.

Perhaps, one of the outstanding changes in application of materials for this area (State of Virginia) was observed this year. A 2½% Heptachlor granular formulation was recommended in Virginia for control of alfalfa weevil. Many advantages were given for this type of application. Perhaps, the greatest disadvantage was price per acre when compared with spraying. The demand exceeded everyone's expectations. Time of application throughout the state varied because of climatic conditions. Majority of material was applied during last week of February—up to middle of March. I do wish to point out, this material was not mixed in fertilizer. It was applied as a 2½% heptachlor granular at 40 to 60 pounds per acre. Material was applied with fertilizer spreader or with Cyclone Seeder. Recommendation called for 1 to 1½ pounds actual heptachlor per acre. I understand results obtained with this type of application have been very satisfactory.

True, heptachlor emulsifiable concentrate is still the number one material used for control of alfalfa weevil throughout our operating territory. We feel we are experiencing increased volume on this product because many growers are cognizant of the fact that they have to initiate an insect control program on alfalfa. The program in some parts of the territory is also designed for control of pea-aphid. Malathion emulsifiable concentrate, is the recommended material.

Herbicides seem to be moving in the same proportion as last year. Various 2,4-D formulations appear to be preferred throughout the territory. Some inquiries have been obtained on Randox and Vegadex.

Through our own wholesale operation in Louisville, Kentucky, there has been a great increase in demand for 3 pound packages of copper sulphate. This size is ideal for formulating a 3-4-50 Bordeaux mixture as recommended for wildfire control. Antibiotics, also recommended for control of wildfire, seem to be moving to our agencies in same quantity as in previous years.

Our dust plant operation, located at Baltimore, has shipped approximately the same quantity of 5 pound packages of dust as previous years. At present, there seems to be little variance in the demand for 5 pound packages of dusts containing active ingredients such as rotenone, DDT, copper, methoxychlor and/or zineb. It is difficult to predict movement on commercial dust formulations. Movement is dependent on number of insects and amount of inoculum in the area. These are, in turn, governed by climatic conditions. True, there is a preference for emulsifiable concentrate on commercial still formulate a large tonnage of commercial dust formulations.

All in all, it is going to be a difficult season to judge even if we have a break in the weather. Everyone seems to be waiting for the starter's gun. I only wonder what we will be faced with if the season is delayed another two or three weeks. Prices have been somewhat unstable during the past two months. What will prices be like in the future if the weather breaks and the consumer begins spraying or dusting for control of insects, fungi and weeds?! Only time will tell!!★★

Expect Infestations

by Carl Behse

Agricultural Chemicals Inc.

THE "Pesticide Outlook" this season in our trade territory (the Mid-South and Southwest) can be compared to an incomplete stud poker hand.

As of early May, we have an ace in the hole—heavy insect infestations are almost a certainty. The second card showing is a deuce in most of our territory—excessive rains delayed the season from 3 to 6 weeks, causing a danger of acreage abandonment, high replanting costs, expensive insect control, and the possibility of a late rainy season harvest. These factors, plus the weak cash and credit positions of many farmers and dealers, may reduce demand and purchasing power materially

With the many unpredictables ahead of us, we can only hope that an ace or two will show up in the three remaining cards, to make a winning hand.

We anticipate no startling changes in use of new pesticides this year. Buyers may be expected to exercise a "wait and see" attitude and to pursue a "hand to mouth" buying policy.★★

Phosphates for Cotton Should Repeat in '58

by Roger Roth

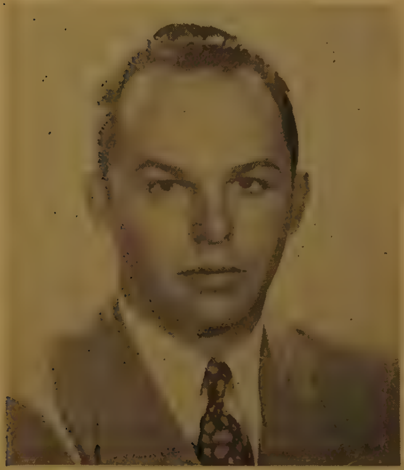
Velsicol Chemical Corporation,

ALTHOUGH there has been a great deal of talk regarding the current business decline, farm income is up. The farmer is in a buying mood, especially if he can be shown that the chemicals he uses will return a profit. In addition, acreage restrictions have further aroused farmer interest in the use of chemicals which will increase his yield. Greater educational effort by both extension workers and industry are doing much to emphasize to the farmer the value of agricultural chemical use.

Spring rains, which favor insect, fungi and weed development, have been heavy in all parts of the country. This should increase consumption of all agricultural pesticides. At present, those pesticides that are applied as preventatives appear to be experiencing the strongest demand. Aggressive promotional campaigns utilizing favorable experiment station results are doing much towards encouraging this early movement.

In the cotton producing areas the phosphate type insecticides were widely used in 1957. The excellent safety record maintained during this period will undoubtedly extend the usage of these materials in 1958.

ROGER ROTH



Chlordane continues to increase in use for numerous garden and turf applications. With the advances in simple methods of application, the "backyard" gardener is using more chlordane each year. The new use of chlordane as a pre-emergent control for crabgrass seedlings has resulted in tremendous interest and increased sales.

With favorable weather conditions, there should be an increasing demand by farmers for all types of pesticides, resulting in large consumption in 1958.★★

1958 Demand Above That of Previous Year

by L. Gemmell

Geigy Agricultural Chemicals Co.

BASED on our early season experience, we are certainly optimistic on sales prospects for the balance of the year.

Early season demand, at least for the products we offer to the trade, has been excellent and present indications are that this trend will continue, indicating a substantially increased total volume for 1958. In comparison with the first few months of previous years, 1958 stands out substantially over previous ones from the demand point of view. The fact that many pesticide jobbers are taking a strong position at this time of year indicates that they, too, look forward to an extremely favorable season.

From my point of view, no particular class of products appears to be moving better than another at this point, which would indicate that all the industry can expect a lift for the balance of the year, if the present trend continues.

With the granting of additional residue tolerances, many fields of use are being opened up to some of the newer pesticides and increased activity can be looked for with these new chemicals. This is particularly true in the field of herbicides, where new chemicals for some highly specialized uses are being adopted.

Strong activity seems to prevail generally, with the greatest activity being evidenced in those areas experiencing an earlier than customary season as, for example, the Pacific Northwest whose season, following mild winter, was substantially earlier than usual.

If our experience is borne out by that of others, and, if we can anticipate a relatively normal season from here on out, the entire industry should have a fine successful 1858.★★

Lou Gemmell

Cotton Pest Control Program Spurs Consumer Interest

by P. J. Reno

Agricultural Chemicals Division
Hercules Powder Company

1958 should be a good year for sales, although it is of course still too early to predict what effect the weather will have on the cotton crop and the boll weevil population in the Cotton South.

As far as Hercules Powder Company is concerned, one of the most reassuring trends noted so far this season is the industry reaction to a *complete* and *systematic* program of cotton insect pest control. Such a program, planned to check insects that delay the growth of the cotton plant early in the season, to kill off overwintered boll weevils and to keep late season infestations down to a minimum, has stimulated wide-spread interest from the formulator to the cotton farmer himself.

P. J. Reno

There are many factors responsible for this interest:

1. Buyers are looking for quality cotton, and are willing to pay for it. Traditionally, early cotton is quality cotton. It is difficult — if not impossible — to produce early cotton without a well-planned, complete program of cotton insect control.

2. The early freeze in the fall of 1957 emphasized the hazards that surround late maturing cotton. Much of the cotton affected by the freeze could have been picked weeks earlier if a good insect control program had been followed.

3. Cotton farmers are asking more questions than ever before about insect control. They want to know *why* one practice is succeeding and another is failing. They want to know *when* to apply insecticides, and they want to know *how* they can get the best yields for the money they spend on insecticides.

4. More and more cotton farmers are searching for formulators who will furnish them with quality insecticide materials *plus* expert guidance in their use. Formulators who are willing to accommodate these farmers enjoy a high volume of repeat business from satisfied customers.

(*Continued on Page* 118)

1958 Prospects for Agricultural Pesticide Sales

by Carlos Kampmeier

Rohm and Haas
Philadelphia

WE look for the 1958 pesticide season to be a good one. This optimism is based on the anticipation of a considerable increase in the demand for Kelthane miticide, and a modest increase in sales of Dithane fungicides, Perthane insecticides, and Triton emulsifiers.

The establishment of residue tolerances for Kelthane miticide by the Food and Drug Administration on a wide range of crops is expected to result in a modest usage of this material; particularly, on fruit for summer control of two-spotted and European Red mites. Kelthane has demonstrated a high degree of effectiveness against a wide range of mite species and remarkable, persistent residual activity.

Providing weather conditions in the Middle Atlantic and Northeastern states are more nearly normal this season, we expect to see an increased usage of the carbamate fungicides—particularly maneb fungicide on tomatoes and potatoes and zineb fungicide used alone or in combination with captan in late cover sprays on apples. We again expect to see substantial usage of zineb fungicide for control of russeting and greasy spot on citrus in Florida as well as the use of this fungicide on citrus in Texas.

The dollar and cents benefits from the proper use of modern pesticides are becoming more and more apparent to farmers every year. With anything like normal conditions for the development of crop diseases and insect pests, and with sound merchandising of the agricultural pesticides by distributors and dealers, we at Rohm & Haas are convinced that a good pesticide season can bring real benefits to manufacturers, resellers, and to the farmers who use these products.★★

FOREST FERTILIZATION

. . . a staff report on recent studies into the prospects of increasing timberland output with fertilizers

CONTINUING research into the prospect of increasing the growth of forests and bringing waste lands into useful timber production by the use of fertilizers and other soil amendments has led to the preparation of a considerable number of reference works on the subject.

Forest fertilization has been a standard practice in Europe for some time, of course, but only in recent years has it been seriously considered in the United States. Late in 1956, the Nitrogen Division of the Allied Chemical & Dye Corporation published a 112-page report on German forest fertilization. The report, translated from the German, was useful to forest workers in the U.S. because the species of trees and chemicals mentioned are the same as those found in the United States.

In 1957, the Nitrogen Division prepared a translation of a Japanese report on fertilizing forest lands and followed this with a 300-page, world-wide bibliography of forest fertilization to further contribute to increasing interest in the subject.

During that same year, tests were conducted in New York and Washington that indicated nitrogen could increase tree growth by 40 to 65 per cent. Complete fertilizers also were tested with marked success in boosting tree growth. The first aerial application of a complete fertilizer to a forest took place in 1956 at the Rutgers University Dairy Research Farm at Beemerville, N.J. A 12-12-12 fertilizer was spread over an 11-acre stand of red pine at the rate of 400 pounds per acre in a spreading time of six minutes. Measurements of the fertilized trees were made after the first growing season to determine the extent of their response to the fertilizer. The well fertilized trees proved to be greener, had longer needles and were more healthy in general than trees growing without sufficient plant food.

This article reviews some of the more recent findings on the subject, which indicate that work is continuing and, in fact, increasing. The studies range in interest from the efforts of forest poor countries to increase their wood output to the effect of fertilizers in improving the color of ornamental trees.

Last year, an experiment in fertilization of slash pine near Lake City, Fla., resulted in increased growth of 36.6 per cent and increased gum yield of 23 per cent. In a four-year test by the Southeastern Forest Experiment Station, 500 pounds of nitrogen fertilizer per acre

The use of aircraft is the most practical method for applying fertilizer to vast, inaccessible forest areas such as this.

A single airplane can apply fertilizer to commercial stands at a rate of 4400 pounds per acre with 40-foot swaths.

were applied annually. The study, however, did not test the economic feasibility of fertilizing trees.

Two methods of application were tested in experiments in Spain, using a complete NPK fertilizer on one-year-old plantations of three different clones of poplars. The fertilizer was scattered on the surface, in a radius of 50 cm. from each tree, and it was put in holes at a depth of 20 to 30 cm. and 40 cm. distant from the tree. There was no significant difference between the two methods, but the fertilizer treatment produced striking increases in diameter and height growth over controls.

Nitrogen fertilization trials were made on 15 to 20-year-old natural Douglas fir stands growing on poor sites in western Washington. Annual height growth was used as the criterion of response. On both shallow residual and deep glacial outwash soils, response to nitrogen was very marked. Larger more vigorous trees responded more than smaller trees and resulted in more rapid suppression of these small trees. Foliage color changed from yellow to dark green after fertilization and before height growth response. The nitrogen content of the needles increased from less than one per cent to 1.2 and 1.8 per cent after fertilization.

Tests in Queensland, Australia, were conducted to determine the effect of phosphate on slash and loblolly pines. The disease known as fused needle, which occurs on some plantations in Queensland, was corrected by the application of phosphatic fertilizers. Where phosphorus was deficient, growth of plantations was slow, and financial yields were much delayed, or, in extreme cases, practically non-existent. A minimum total P_2O_5 content of about 125 p.p.m. in the surface soil is considered to be required for healthy growth. Finely ground rock phosphate proved to be as efficient as superphosphate in reducing the incidence of fused needle and stimulating the growth of pines. Initial response to rock phosphate and to superphosphate occurs in the same year, but is not as great with rock phosphate as with superphosphate.

Broadcast applications seemed to be preferable in older plantations, but, when treatment was applied at planting, application to the individual stems appeared to be satisfactory. The future annual requirements for rock phosphate for Queensland forestry have been estimated at about 225 tons.

By selecting fast-growing timber species for planting on the basis of soil characteristics, and by fertilizing the trees, a considerably increased production of timber can be attained in the Netherlands without changing the forest area. Research on the growth relationships of the most important timber species shows that there is a scientific basis for the application of plant foods.

The oldest continuing experiment on Loblolly pine was established in 1951 by the Nitrogen Division in the Hill Forest of North Carolina State University. The forest has indicated marked response to nitrogen. The division's most recent experiment is being conducted at Fernandina Beach, Fla., in cooperation with Rayonier, Inc., to determine both growth and the possibility of obtaining better wood fiber for quality pulp.

Foliage analyses of native vegetation were found useful as a diagnostic aid in selecting tree species for planting on potassium deficient soils in the Adirondack Mountains of New York. The potassium deficient soils are sand plains of glacial outwash origin that were abandoned for cultivated crops in the 1920's. An analysis of potassium in leaves of native vegetation showed a relationship to exchangeable potassium in the soil for white pine, choke cherry, American beech, trembling aspen, wild strawberry, and beard grass. Foliar potassium decreased as the season progressed for red maple.

Seedlings of western red cedar were grown in a greenhouse in sand and solution cultures in which the treatments included; complete, minus iron, minus boron, low nitrogen, low phosphorus, low potassium, low calcium, low magnesium, and low sulfur. Young trees were grown also in pot cultures of forest soils to which various fertilizer additions were made. The periods of growth ranged from six to 24 months. Yields were recorded and chemical analyses performed on the foliage harvested from each experiment. Among the principal results noted was that the trees made excellent growth in culture solutions and sand cultures, reaching a height of four and one-half feet in some instances. Growth was slower in soil cultures, probably because of leaching out of soluble nitrogen in the greenhouse watering. Definite responses to nitrogen and phosphorus were observed in the pot culture experiments.

One hundred acres of pine and spruce plantations on coarse, sandy, outwash soils of the Adirondacks pro-

(*Continued on Page* 123)

WASHINGTON REPORT

By Donald Lerch

IF you ever wonder why Congress does not come up with some long-range farm legislation, here are some of the answers gleaned from recent talks with influential farm legislators.

Everyone in the agricultural chemicals industry has long ago become aware that agriculture is rapidly changing. Farmers are using more farm equipment, fertilizers and pesticides to produce more crops. At the same time, expanding suburbs, highways, airports, and industrial plants are cutting sharply into available farm land.

These trends are bringing farmers into a three-way race. One factor is decreasing farm land; another is increasing farming efficiency; and the third is the effort to maintain some of the values of the traditional small family farm in an era of increasing technology and rising population.

It is no surprise that Senators and Congressmen looking out over the changing agricultural landscape are finding difficulty in coming up with any kind of satisfactory farm legislation. Individual farmers face quite different problems and fail to come to any agreement with other farmers on what Federal farm legislation would be best for agriculture. As one Senator commented recently, Congress cannot dope out legislation and shove it down the farmers' throats. Farmers have to agree on some kind of solution among themselves before Congress will be able to come up with anything more than stop-gap measures which please almost no one.

What Congress is seeking right now is an omnibus farm bill which will deal with all farm commodities. The success of this attempt depends upon whatever agreement can be reached among farmers themselves on what they want and how they can get it.

How this will affect over-all agricultural chemicals sales is far from clear cut. It has been estimated, for example, that the soil bank program has reduced fertilizer sales in some areas. At the same time, some in the industry report that it should tend to increase over-all sales. As acreage is reduced, farmers normally would use more fertilizer and more pesticides to increase yields on the remaining acreage. There is no reliable information to indicate that this actually is happening, however.

While not directly related to agricultural chemicals sales, Federal Government efforts to find new outlets for farm production may encourage more farmers to work for higher yields. Two plans in this field are in the works. One is appropriation of more Federal funds to spur research on new uses for farm products. The other is the program for disposing of farm surpluses overseas. The Senate already has voted a two-year extension of this program, authorizing spending $1.5 billion per year to finance disposal of surpluses abroad.

A new factor looming larger in Congressional thinking on farm legislation is the attitude of consumers. The American population has been shifting quite rapidly from farm areas to urban and suburban areas. Points of view have changed with the shift in location, and so has the balance of political power. Congressmen are more conscious now than ever before that everything Congress does for the farmer also affects the housewife who buys farm products in the cities. Congress is not overly anxious to pass laws which benefit farmers at the obvious expense of the nation's housewives.

Leaders in the fertilizer and pesticides industries recognize they have an important role to play in this changing agricultural picture. By aiding farmers to produce more efficiently, they help to overcome falling farm acreage, boost crop yields, increase farmers' net incomes, and still hold down prices that housewives must pay in city stores. Not all Congressmen are yet fully aware that wider use of agricultural chemicals might go a long way toward helping to solve some of their knottiest legislative problems.

* * * * *

The National Agricultural Chemicals Association has just launched a new membership campaign. NAC already represents the majority of basic pesticide chemical producers and a large number of formulators. Aim of the membership drive, however, is to expand membership to include an even wider representation of producers and formulators throughout the country.

To this end, NAC has prepared a new and colorful membership kit which details how NAC is organized, what the Association and the industry have accomplished in the past 25 years, and the benefits companies can expect from Association membership. Single copies of the membership kit are available to those interested in NAC membership.

* * * * *

The growing agricultural chemical sales potential in highway roadside maintenance is developing faster than many people realize. A major bottleneck in expanding this market has been in getting state officials to use information now available and to test the efficiency of chemical roadside maintenance for themselves.

This bottleneck is now being broken in a number of states. The Virginia State Highway Department, for example, is now cooperating with the State Agricultural Experiment Station in testing a variety of materials and equipment. As in all states, the Highway Department has the land and the problem. The agricultural experiment station has the scientific know-how and the research facilities.

Washington highway officials believe that once sound information on materials and equipment is developed from such cooperative testing in the states, the state and county highway maintenance men can put the information into practice very quickly. The trend toward chemical roadside maintenance is being speeded by the new emphasis on wider and more beautiful roadsides. The feeling in Washington and in a number of states is that state and county officials are becoming aware that the beauty and safety features now demanded cannot be maintained within current budgets unless chemical mowing is used.

These officials say, however, that a sudden boom in sales of chemicals for highway roadside maintenance is not yet in the cards. The materials must be tested in the various states, men must be trained to apply the chemicals properly, policies on where and when to use the chemicals have to be formulated, and the new method has to be sold to the general public. They point out that weed and insect control are problems only in settled areas—in towns, suburbs and in farm areas. This calls for good public relations programs to convince the public that chemical maintenance is in the public interest. How fast progress is made in developing this new field will depend largely on how quickly both the technical and the public relations problems can be overcome.

* * * * * *

Population figures issued by the U. S. Census Bureau provide tantalizing reading for pesticide and fertilizer manufacturers who are interested in the home garden market. Each year's figures show another astonishing increase in the number of suburban dwellers.

From 1950 to 1956, for example, suburban populations jumped 30%, while city populations went up only 5% and farm populations declined. While 1957 population figures have not yet been published, independent estimates indicate they will show 50,000,000 suburbanites. This amounts to more than 10,000,000 families. If each one spent only $5 a year on pesticides, the market would be double current estimates of sales to the home and garden market.

Companies in the garden market are finding that the population figures alone are not too reliable a basis for sales planning. The many children in the suburbs are not yet in the market for garden pesticides or fertilizers—unless they buy them in connection with school garden programs. More significant, many adult suburbanites have not yet been convinced chemicals can help them make gardening easier.

* * * * *

According to latest reports, the imported fire ant eradication program is moving ahead smoothly in the South. Last month USDA put a quarantine on parts of eight Southern states to prevent the spread of the fire ant while the eradication program is underway. To keep the Southern public informed on the importance of fire ant eradication, NAC has released five transcribed talks to some 650 Southern radio stations. Talks are by Senator Allen J. Ellender of Louisiana, Chairman of the Senate Agricultural Committee; Herbert Stoddard, Sr., world-reknowned authority on quail; Mr. and Mrs. Tom Carter, Jr., leaders in the Audubon Society in Georgia; Dr. Rodney Jung of the Department of Tropical Medicine, Tulane University; and Dr. Wilson Sowder, Health Officer of the State of Florida. The sum of the observations by these authorities is that fire ant eradication is essential to the health and prosperity of the South, and that, properly used, the chemicals employed in the eradication program will cause no undue hazards to wildlife or to humans.

* * * * *

Exponents of appealing to the farmer's natural desire for higher net income have often cited the lack of sound figures in this field as one of the industry's outstanding sales weaknesses. In an effort to overcome this lack, last year NAC made a survey of all state agricultural experiment stations. Only 19 experiments showing how much added net income farmers could expect from using pesticides were uncovered. But these were impressive. The tests showed that for every $1 invested in chemical pest control, farmers could expect a return ranging from $4 to $22 depending on the crop protected and the pest being controlled.

Now a more comprehensive report has come in to Washington from the Colorado Agricultural Experiment Station. This shows that in 1957 Colorado farmers realized a return of $23 for every $1 invested in insect control. Added weight was given to the report by the statement that insects in Colorado caused losses of more than $7 million to unsprayed crops. In the opinion of some USDA officials, this Colorado report indicates a growing awareness in the states of the need for economic information on the benefits of scientific pest control. Reports of this kind, coming in each year from every state, could do a great deal to further scientific pest control and aid farmers in judging when and how best to invest money in pest control operations.

* * * * *

In a little-publicized meeting of Federal Plant Quarantine Inspectors in Washington recently, Agriculture Secretary Ezra Taft Benson expressed his concern over protecting U. S. agriculture from an "invasion by insects, pest, and diseases."

As Secretary Benson sees it, booming foreign trade, which benefits agricultural producers and exporters,

(Continued on Page 117)

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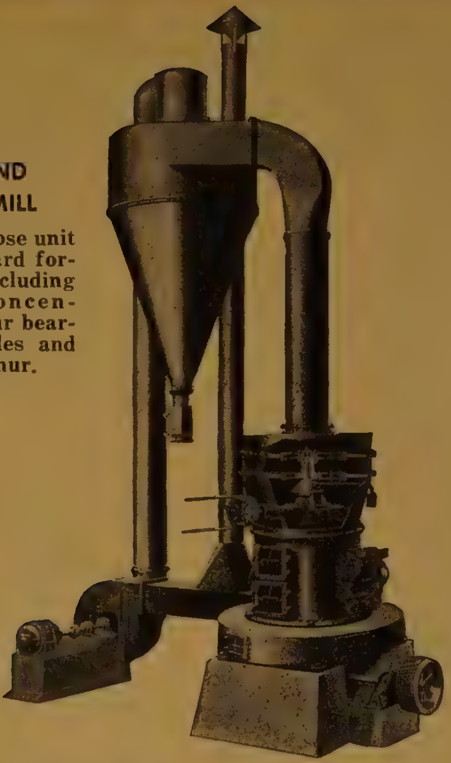

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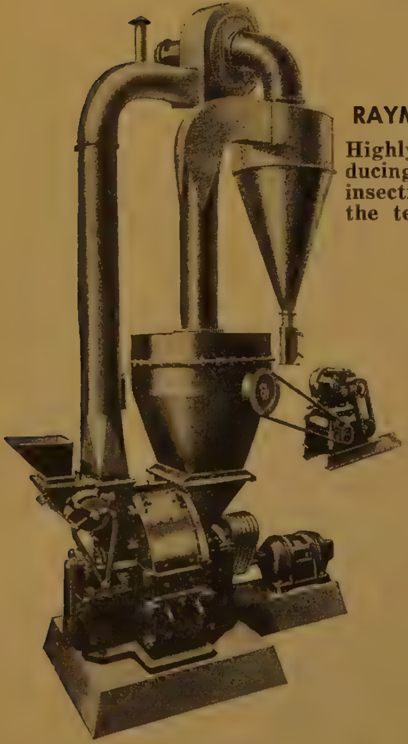

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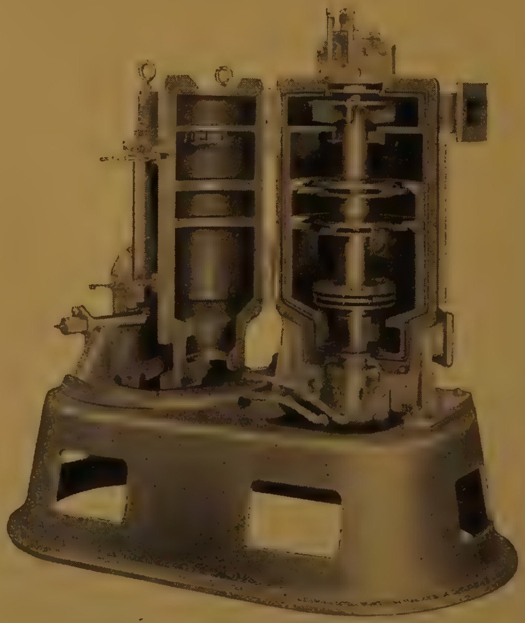

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Fertilizer Views and News

Dr. Sauchelli is Chemical Technologist for National Plant Food Institute.

Dr. Vincent Sauchelli

Hunger Signs or Enzyme Pattern?

PLANTS and animals may be inferior in quality long before hunger signs of deficiencies or excesses are evident. That comment was made by Dr. William D. McElroy, director of the McCollum-Pratt Institute of the Johns Hopkins University, Baltimore, Maryland, in a lecture before the National Academy of Sciences this past January. Other statements interesting to us in the fertilizer industry were made and these will be noticed in what follows.

Dr. McElroy and his staff at McCollum-Pratt are dedicated to the investigation of trace elements in biology and agriculture. Some novel findings on the function of trace elements in these branches of science were described in the lecture. Since these elements play such an important, but as yet not fully understood, role in the lives of all created things, we may expect new and acceptable developments from research projects at this Institute.

Foods and nutrients are needed for growth by the cells of every organism. Their function is to generate and release energy, build and repair cell tissues, and regulate the machinery of metabolism. Because trace elements are needed in small amounts, scientists believe they function primarily as catalysts, and most often they do this as a part of an enzyme system. They act, therefore, somewhat like vitamins which are organic micronutrients, whereas the trace elements we talk about are inorganic. Deficiencies and excesses of nutrient elements are a matter of degree.

In his talk, Dr. McElroy emphasized that the visual symptom of a deficiency, popularly called a "hunger sign," may show up long after the plant may actually have suffered a deficiency and become inferior in quality. Furthermore, yield and growth measurements cannot be considered adequate as manifestations of a normal, healthy organism. The real, significant test for such a status has to be found in the enzyme patterns. There is the heart of the true test. If the diagnosis of plant and animal diseases — deficiencies — is to be of value, it should be made early and on the enzyme systems of the organism. Studies of growth and yield will not give the answer.

Biochemists are now concerned more with explaining how trace elements behave in enzyme systems than with whether this or that trace element is essential in nutrition. This results from evidence that growth or yield measurements are not adequate criteria by which to determine whether the various systems of metabolism are properly functioning for normal health. Dr. McElroy posed the question: Can we apply trace elements and other fertilizer nutrients to the soil and in the diets of animals to the point where we get a maximum crop yield or growth rate and be satisfied that we are giving that organism the highest nutritional benefit? Several excellent examples cited indicated that the answer is No. And the examples cannot be considered extreme and special cases. Visual "hunger signs" of nutritional deficiency or excess in plant and animal don't have to be present to prove actual deficiencies in the health and vigor of the organism. The speaker said that what seems clear from their studies is that for each level of trace-element supply during growth, a characteristic enzymatic pattern appears without regard to the yield. The enzymatic pattern is the real test. Enzyme patterns keep changing under each level of trace element nutrition, and such changes, when understood, are most valuable to the diagnostician. Growth studies cannot possibly give such information.

The lecture as a whole was by necessity highly technical and scientific, considering the place and audience. Perhaps, to illustrate the phase which was noted above, the following brief report from the North Carolina Experiment Station may be pertinent*. It shows that trace elements can affect the plant's use of oxygen.

It is known that plants use oxygen constantly to burn up sugars and fats for energy. Recent tests with tomatoes reveal the influence of trace elements — iron and copper — on enzyme activity. Iron deficiency reduced by half the enzyme activity in the roots; copper deficiency reduced enzyme activity in the roots by 75% and in the leaves by about 88%. When both elements were deficient the enzyme activity was still further reduced. These studies are adding new knowledge of how mineral elements affect the use of oxygen by plants and constitute a new basis for the more efficient use of fertilizer materials.★★

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*N. C. Research & Farming. Winter 1958. Page 8.

As a reminder, the 1958 Fertilizer Industry Round Table will be held October 29-31 at the Park Sheraton Hotel, Washington, D. C. See page 99 for advance program details.

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Location	Crop	Material	Yield
Mississippi	Tomatoes	**DYRENE**	**215 lbs. per plot**
	Tomatoes	Tribasic Copper Sulfate	181 lbs. per plot
	Tomatoes	Captan	180 lbs. per plot
Florida	Tomatoes	**DYRENE**	**915 lbs. per plot**
	Tomatoes	Carbamate	317 lbs. per plot
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	Potatoes	Captan	306 bu. per acre
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CAN AGRICULTURAL AVIATION SURVIVE?

by

R. E. Monroe

Assistant
Executive Director

National Aviation
Trades Association

POTENTIALLY, the technique of aerial application has a tremendous future. The industry may never employ more than 5,000 operators, but it can attain stature far exceeding that figure. Moreover, it can easily become the major regulating factor in food and fiber production.

In an era of sputniks and atoms, it is easy to overlook the fact that food, even more than guns, is a basic tool of diplomacy and a determinant of both foreign and domestic policy. As population expands and tillable acreages diminish, the value and significance of aerial application services can become far greater than anything we dream of today. Nor is it far-fetched to say that civilization's survival may depend upon the aerial applicator. Who else is so ably trained, so well dispersed, or so well equipped to carry out chemical decontamination by aerial application after some possible future nuclear Armageddon?

The immediate problem, however, is whether aerial applicators can survive long enough to achieve the prominent position to which they might justifiably aspire. In the public mind we find little acceptance. In government, at all levels, we are met with unreasoning fear of the clamor of press and legislative assembly—fired by the hysteria of mass ignorance of the manifold beneficial uses of the air. The result is a steady flow of antagonistic and ill-considered press releases, speeches, articles, and regulatory proposals.

Currently we face several obstacles to survival. Some are problems of long standing. Some are of the moment, but all must be met.

The wrangling over airspace seems far removed from our area of concern. Close inspection, however, reveals a life-or-death struggle for our industry. Demands for reductions in ceilings and visibilities, enlargements of control zones, requirements of positive control are reaching ridiculous extremes. One current proposal would require a clearance before taxing on your own private dusting strip!

As population expands, demands for housing, shopping centers and golf courses devour our airports. Unless we can create a respect for their present value, we face a recurring problem in establishing new bases at ever increasing costs. Inadequate zoning laws for protection of airports and lack of financial support for those private landing areas which are available to the general public are two basic obstacles to survival.

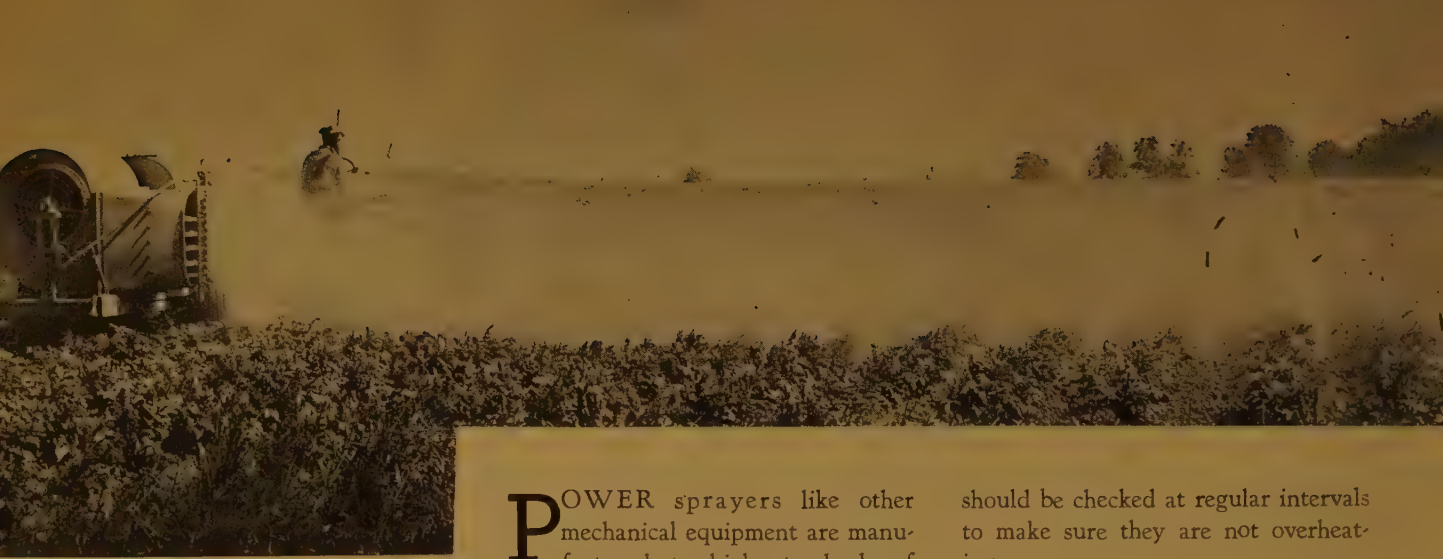
Our industry has long needed a frequency in the VHF aeronautical communications band to increase the efficiency and safety of our operations. To us, the benefits are so obvious that it seems impossible that any can fail to recognize the situation. Such is not the case, however.

Publicity in the general press has been our bane for years. If it is possible to say something bad about aerial application — it will be said. If it is possible to say something good—it will be overlooked. Facing us is the gigantic task of creating not only an understanding of the nature, but also an appreciation of the worth of agricultural aviation's services in the production of food and fiber. The critics hysterically demanding our removal from the air do not comprehend our beneficial relationship to the food they eat, the clothes they wear, the houses they inhabit, the fish they catch, the deer they hunt, or the trees in whose shade they live. People chronically fear what they do not understand, and unfortunately they understand aviation poorly, and aerial application barely at all. To survive, we must create understanding.

Our own knowledge of ourselves is rudimentary, unfortunately. This impedes our efforts to inform others and create understanding. The agricultural survey of 1956 by NATA was the beginning of a program to overcome this deficiency. Sadly, most of our industry made no effort to supply the information requested. They could not visualize the manifold benefits to be derived; such as better public relations, aircraft,

(*Continued on Page* 119)

The CARE



POWER sprayers like other mechanical equipment are manufactured to high standards of performance. They will give years of high performance when used and serviced correctly. To maintain this performance there are a number of good maintenance practices which should be adhered to closely by the sprayer owner.

The sprayer should be given a careful general inspection before placing it in service. This inspection should include checking drive belts and other component assemblies for alignment. These may have been shocked out of position during shipment. In addition, transportation shock may loosen the bolts that maintain good alignment, which is a requisite for maximum product performance.

Further, an inspection of the exterior of the tank may eliminate nozzle plugging or pump priming problems brought about by an undesirable substance getting into the sprayer tank after the manufacturer's inspection, but prior to placing the sprayer in service.

The manufacturer's instructions pertaining to the care and service of the sprayer should be carefully reviewed prior to putting it into service. The lubrication instructions should be followed faithfully, using the specified lubricant. Special precaution should be exercised to see that dirt or other foreign substances are not placed into bearings and other critical areas where lubricant is needed. During the first day of operation, bearings and other critical areas should be checked at regular intervals to make sure they are not overheating.

As a step in extending plunger cup and cylinder shell life, it is usually recognized as a good practice to assure immediate priming of the spray pump. This can be accomplished by making sure that the suction line from the pump to tank has no obstruction to retard the spray solution passage. The owner should remove discharge valve caps and, with a pointed object holding discharge valve open, pour water into cylinder body. This procedure should be followed for each cylinder.

After pump priming has been completed, the spray pump should be operated at about twenty-five percent of operating speed for a two hour period, stopping the pump at twenty minute intervals to check for excessive heating of the cylinder shell opposite the water end pump. A similar procedure should be followed during plunger cup replacement.

Corrosion of spray equipment is a common occurrence because of the inherent characteristics of the materials applied with this equipment. However the rapidity and extent of the corrosion factor can be held to a minor problem through good storage practice during the in-operative period. It is during this period that an estimated 90% of corrosion problems occur.

Illustrations on this page show the custom spraying of orchards, trees, and row crop application of agricultural chemicals.

# of SPRAY EQUIPMENT

by L. Duffy

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During an idle period of less than two weeks the pump, tank and distribution plumbing system of the sprayer should be thoroughly flushed with clean water. This can readily be accomplished by filling the spray tank with water, starting the sprayer and allowing the material to be discharged through guns or nozzle openings.

In preparation of the sprayer for a long period of inoperation (3 to 6 months) further precautions should be taken to hold corrosion within check. After thoroughly flushing with water, the interior of tank, pump and plumbing distribution system should all be coated with a light grade of oil.

This can be accomplished by filling the tank 4/5 full of water, then adding five gallons of light grade motor oil or dormant oil spray. The sprayer should then be turned on, allowing the water and then the oil to be discharged through the plumbing system — spray gun or nozzle opening.

In those areas where corrosion is an extreme problem, the outside of the sprayer tank along with hood assembly of sprayer should be coated with light weight oil. After the oil coating practice has been completed, it is advisable to remove all drain plugs to allow the sprayer to drain thoroughly. With engine power units, the engine should be prepared for the idle period in accordance with the engine manufacturer's recommendations.

In maintaining the maximum performance from a power sprayer, periodical attention must be directed to pin pointing and correcting minor mechanical failure which results in time from normal wear of the equipment.

The accompanying service chart can help the sprayer owner determine the service problem and probable cause. Appropriate corrective measures required to eliminate the failure should be taken, lest the failure bring about more critical failure in other parts of the equipment.

Although the operator may not have experienced any mechanical failure on his sprayer, it is always advisable to have the equipment thoroughly checked by a competent sprayer service station in advance of the next annual spray season. In order to ensure good workmanship and parts service, he should make the equipment available to the sprayer service station 30 to 60 days in advance of the anticipated spray season.★★

SERVICE CHART

SERVICE PROBLEM

A Failure of pump to build pressure with guns closed
B Failure to hold pressure with guns open
C Pump is noisy
D Pump gets hot
E Pressure gauge shows abnormal fluctuation
F Regulator chatter

POSSIBLE CAUSE OF PROBLEM	F	E	D	C	B	A
1. Pump not primed						X
2. Valve closed in suction line						X
3. Suction line or sediment chamber clogged					X	X
4. Air leak in suction line					X	X
5. Pressure regulator valve badly worn					X	X
6. Pressure regulator not properly adjusted					X	X
7. Pump Plunger cups or valves badly worn					X	
8. Pressure regulator overflow valve held open by manual control					X	X
9. Pump cylinder body cracked					X	X
10. Holes in gun discs are too large					X	
11. Small air leak in suction line					X	
12. Need vacuum chamber in suction line				X		
13. Water in crankcase			X			
14. Worn connecting link bearings			X	X		
15. Lack of oil in crank or speed reducer case			X			
16. Foaming spray mixture		X		X		
17. Too much agitation		X		X		
18. Agitator paddle too close to tank outlet		X		X		
19. Regulator plunger sticking		X				
20. Regulator stuffing box nut too tight		X				
21. Regulator stuffing box nut too loose or needs packing	X					
22. Foreign matter under pump valve		X			X	
23. Air chamber waterlogged	X	X				
24. Too much play in power take-off shaft on source of power				X		
25. Loose piston rod				X		
26. Main bearing lock rings out			X			

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Pest Control on Alfalfa

A review of a report on "Alfalfa Seed Crop Insect Control in Washington" by E. C. Klostermeyer, issued by the Agricultural Extension Service, State College of Washington, Pullman, as E. M. 1761.

How to Apply Insecticides

YOU can put insecticides on alfalfa with tractor mounted dusters or sprayers or by aircraft. Ground application is most practical and economical where a grower raises a small acreage of alfalfa seed each year. Aircraft application is most suited to larger acreages where it would be impractical to do the application with ground equipment in a short enough time. It is preferred also in late applications because of wheel damage by ground rigs. For dust applications 30 to 40 pounds of dust are adequate. Ground sprayers should apply from 10 to 25 gallons of dilute spray per acre. Rates of aircraft application vary from 5 to 10 gallons per acre. The higher gallonage is preferred for dense foliage and for the application of systemic insecticides like demeton. Sprays usually are more economical than dusts.

When to Use Insecticides

THE time to apply insecticides depends on the number of insects present and the development of the crop. There is no need for insect control in alfalfa seed fields during the early growth of the alfalfa. Although many insects will be present, it is not until the alfalfa begins to develop flower buds that insects will affect the crop for seed production. Usually, you can get the most economical insect control with an application of insecticide a week or ten days before the crop begins to bloom. This will be about 6 weeks after the first cutting and usually during the first two weeks in July. Most of the lygus bugs will have hatched from eggs laid earlier by the adults but will be too small to do much damage. An earlier treatment would be needed only if you find large populations of adults and large nymphs present, or see much damage to flower buds. However, if you treat the field early, you may need an additional application one or two weeks after the crop begins to bloom to protect it through the seed setting period. One application at the bud stage, just prior to bloom will protect the crop during the critical period of seed setting. If heavy reinfestation from untreated hay fields does not occur, no second treatment will be needed, particularly if there is little crop regrowth.

Insecticides to Use

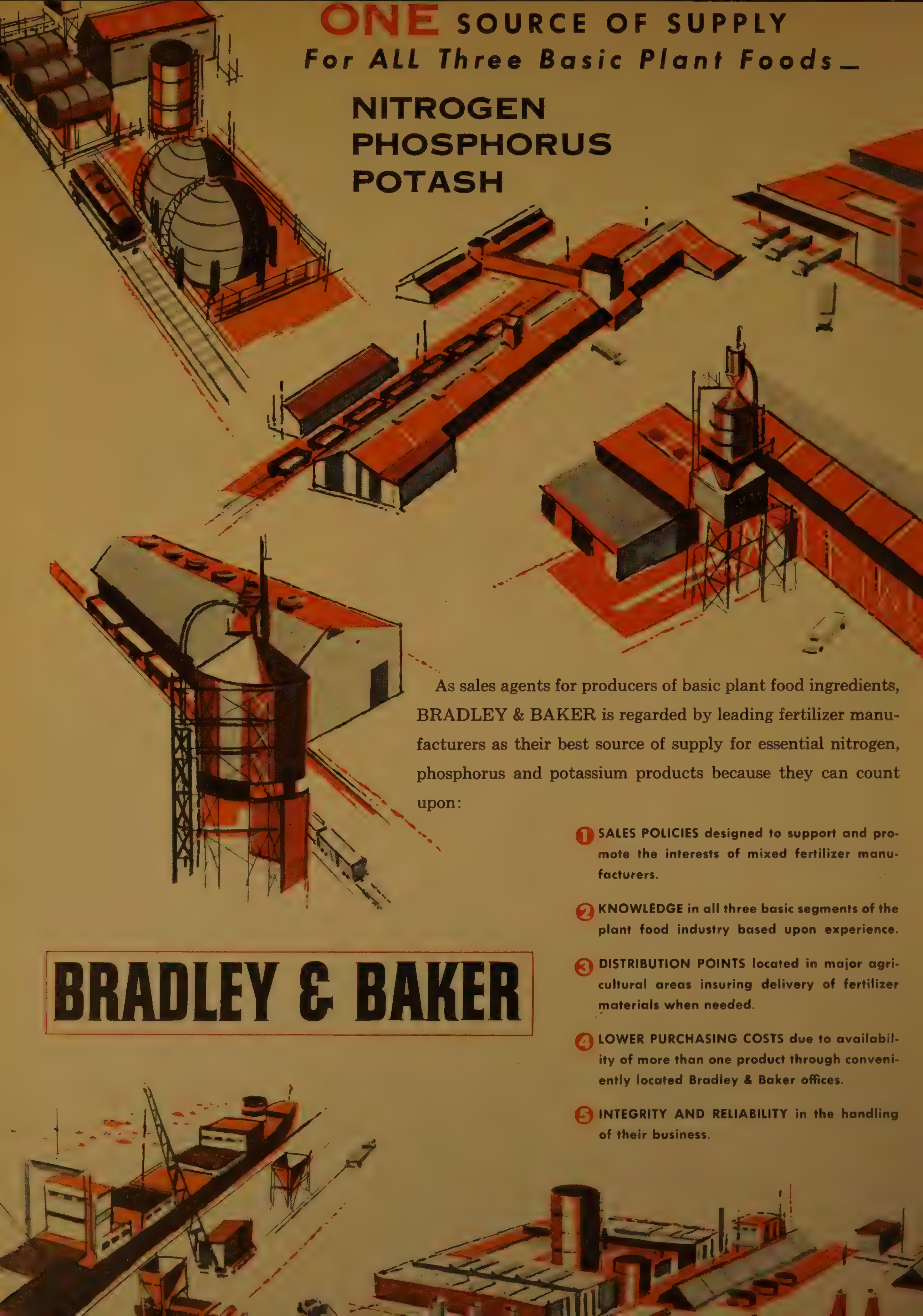
ALTHOUGH many insecticides have been tested for lygus bug control, only three materials are recommended. These combine a high degree of initial kill of the bugs with a long period of residual effectiveness necessary to kill insects reinfesting the field. The materials which have given the best results are DDT, toxaphene, and dieldrin. Each of them has advantages and disadvantages.

DDT was the first material found to be effective for lygus bug control and has given good results for many years. It has a long period of residual effectiveness, and is of low toxicity to bees when not applied directly on them. However, instances of resistance of lygus bugs to DDT have been observed in Washington and other states. In some cases poor control may be due to faulty application rather than resistance—but because of reports of poor control, the insecticide is now used less than formerly. Nevertheless, where resistance has not developed, DDT may be depended upon to give superior control of lygus bugs and high seed yields. In new seed producing areas, where insecticides have not been used extensively, DDT will be a good material to use. To avoid developing resistance to DDT in lygus bugs in such areas, its use should be alternated with another material. If DDT is used in the first application, toxaphene might be used for the second application. DDT does not give adequate control of pea aphids and tends to increase mite populations.

Toxaphene has given good lygus bug control, but under some conditions its duration of effectiveness is less than that of DDT and in nonresistant lygus populations, DDT has resulted in higher yields. However, tests made in 1957 in three different seed producing areas in central Washington, showed that toxaphene gave lygus bug control superior to DDT and resulted in higher yields, either when applied with aerial equipment or with ground equipment. There was no evidence of resistance of lygus bugs to toxaphene. Toxaphene is safe to use on blossoming alfalfa if applied when bees are not in the field. It gives adequate, though not exceptional pea aphid control.

In some areas, there have been claims of poor control with toxaphene. The 1957 tests did not substantiate these claims and it may be that such reports are due to faulty application, to unusual weather conditions, or to standards of control set higher than necessary. No insecticide, unless applied at less than weekly intervals, can prevent reinfestation of fields by lygus bug adults, but each of the three materials listed here should prevent development of lygus bug nymphs for at least three weeks and usually longer. Where control of lygus bugs is poor with DDT or toxaphene, dieldrin may be substituted. Dieldrin is extremely toxic to pollinating insects and its use must be confined to the pre-bloom application. Do not use dieldrin later than one week before *any* bloom is showing in the field (approximately early bud stage). Control of pea aphids with dieldrin is only fair.

Parathion is a good control for pea aphids prior to bloom, but because of its high toxicity to bees, parathion cannot be used on blossoming alfalfa.



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Use it only before bloom and then only if no bloom is showing in the field. Parathion is of little value for lygus bug control. It will kill lygus bugs when it is applied, but it loses its effectiveness after a few days and will permit large populations of nymphs to develop. It should always be used with an effective lygus bug control like toxaphene.

Demeton (Systox) will control both pea aphids and mites, but by itself is of little value for lygus bug control. It is relatively safe to use on blossoming alfalfa, but must be used when the bees are not in the field. It is effective against pea aphids at rates as low as 4 ounces active ingredient per acre, but for long lasting mite control demeton should be used at rates of 6 to 8 ounces per acre. For best results with aerial applications, at least 10 gallons of spray mixture should be applied per acre.

Aramite is effective only for mite control. It can be used as a spray, but aerial applications should be at rates of ten gallons per acre. Dusts may be more effective on dense foliage.

Protect Yourself and Others

Nearly all insecticides can cause harm to man and animals. Use them with care. Read and follow precautions listed on insecticide containers.

Protect Pollinating Insects

BECAUSE alfalfa requires insect pollination and because pollinating insects can be killed by insecticides, be careful using insecticides when alfalfa is in bloom. Use materials which are least harmful to bees and apply them when bees are not working in the alfalfa fields. Washington State Department of Agriculture Order 749 specifically prohibits the use of the following insecticides during bloom: parathion, methyl parathion, BHC, lindane, chlordane, aldrin, dieldrin, metacide, EPN, malathion, endrin, chlorthion, diazinon, and heptachlor. The following may be used during bloom but only if applied before 7:00 a.m. and after 6:00 p.m.: TEPP, toxaphene, DDT, demeton, methoxychlor, rotenone, TDE, DN-111, perthane, and schradan. The insecticide program recommended in this report will not cause appreciable harm to bees. If you use any other program, determine first whether material is harmful to bees.

The alkali bee nesting sites frequently are alongside alfalfa seed fields. When applying insecticides to such fields, be sure that they do not drift into the nesting area, since such drift is even more harmful than the insecticide application to the bees in the field. If necessary, leave an untreated strip of alfalfa along the nesting site to prevent damage to the bees.★★

Aerial Application of Herbicides

THE use of aircraft to apply herbicides in the control of chamise and associated brush species—as a follow-up to controlled burning and seeding—is being studied on a chamise dominated area in the foothills of the Sierra Nevada near Placerville, Calif.

Attempts to convert chamise lands by burning have been directed toward increasing forage for livestock and improving the habitat for deer. Unless the burns are small and scattered, so browsing by livestock will keep regrowth under control, the lands quickly revert to a stand of brush, frequently more dense than before. The use of chemicals, therefore, is believed to offer considerable promise in controlling regrowth of chamise and the seedlings of other chaparral species when applications are made at proper growth stages of the plants and under favorable conditions of soil moisture.

Aircraft spraying, in this instance, is thought to be more practical than ground equipment because of the rocky nature of the terrain and the density of the brush or fire-killed stems. Outside of California, little has been done with aircraft spraying as an adjunct to initial removal of brush by fire or other methods. The studies, therefore, were initiated to develop information on that specific point.

Formulations of 2,4-D and 2,4,5-T or combinations of the two were the spray materials used. The most dependable chamise-sprout control was achieved by spraying in the spring following a summer of fall burn. The main factors affecting chamise-sprout control appear to be adequate soil moisture, uniform spray coverage—as for all types of foliage spraying—and the age of the sprouts.

Diesel emulsions proved superior to straight oil mixtures and consistent results generally were obtained ranging as high as 95 per cent kill of sprouts and 100 per cent of the seedlings. In these studies, the brush seedlings of all species encountered were controlled. However, some seedlings emerged and were established after spraying in certain test areas that had not been seeded following burning or where grass failed to become established. In those cases where no grass was established or where the stand was sparse, there was generally some delayed germination, and survival of brush seedlings following the spraying. This points out the importance of seeding and establishing grass as an essential part of the whole control operation.

Total volume of grass production, especially of established perennials, is greatly increased when brush competition is reduced or eliminated by spraying. A single application of two pounds of 2,4-D per acre nearly tripled forage production the following year in one test area.

An aircraft spray application the spring following a fall burn results in a remarkable general kill on a broad range of brush seedlings, and it also kills most of the chamise sprouts. However, the sprouts of other nondeciduous plants are generally not killed by the spray application, although they are severely injured. Ground-spraying in the fall following the spring aircraft spraying would give the best results.

Conversion of selected areas of chamise to grassland within a rela-

(*Continued on Page* 121)

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California Agricultural Aircraft Association

THE California Agricultural Aircraft Association recently marked its 13th anniversary. It was organized in February 1945 by a group of six agricultural aircraft operators for the purpose of combating adverse state legislation. At that time in California, agricultural aircraft operators were taking the brunt of unfavorable publicity, and it was being proposed that the use of newer chemicals be drastically restricted.

The purposes of the Association were framed: to promote the aviation interests of the member firms; to protect their interests from discriminatory legislation by federal, state or municipal agencies, to represent the member firms in all matters where organized action is required to bring about improvements in public relations, aircraft equipment and service, chemical regulations and developments; and to further the cause of safety and economy in the operation of agricultural aircraft.

Membership in CAAA increased as agricultural aircraft operators recognized benefits to be derived from the organization. Activities of the Association were managed by a president and secretary-treasurer at their own expense, and not without considerable sacrifice on their part.

As agricultural aircraft usage increased, and there was more general public acceptance of aircraft activity, the operators found themselves being legislated for, but by interests not necessarily to their benefit. This resulted in a crisis in 1952, when members agreed that if the organization was to be successful, it would be necessary to spend considerably more time and effort on such items as existing and proposed laws, taxes, insurance problems, and state regulations. It was also recognized that this could not be done on a part-time basis by elected members. The proposed program would require the full efforts of at least one person, so it was decided to raise the membership dues and hire a full-time executive secretary to carry out the aims and purposes of the organization.

Officers of the California Agricultural Aircraft Association, (l to r) James K. Vedder, vice president; James B. French, president and Milton Watts, secretary-treasurer. Inset: Wanda Branstetter, executive-secretary.

Other duties of the executive secretary include: a monthly Newsletter to the industry, distribution of Special Bulletins, keeping the entire membership informed on all aspects of the industry, general correspondence, attendance at industry-related meetings, and, of course, public relations.

In the course of this reorganization of CAAA, it was decided that only owners and operators of agricultural aircraft were eligible for voting or full-membership. A sustaining membership classification was set up to include anyone interested in agriculture and aviation,—but this group does not have voting privileges. The sustaining membership has always numbered at least half the full-voting membership — proof that the allied industries are interested in the agricultural operators' welfare.

CAAA was directly responsible for the recent substantial reduction of compensation insurance rates for the entire California agricultural aviation industry. To offer exclusive benefits to its own members, the Association recently adopted a group compensation insurance plan.

The major CAAA projects for 1958: working for the adoption of a federal certificate for agricultural aircraft operators; federal gas tax refund for the industry; study of the regulations covering the bonding of aerial applicators; sponsoring state legislation to enact a law requiring chemical salesmen, entomologists, and others who make insect control recommendations to growers to obtain a state license; all aspects of industry safety programs; expansion of insurance markets for the industry; and, as always, public relations work.

The CAAA will hold its 9th annual convention in Sacramento, January 1959. It is at these annual meetings that the yearly work is mapped out for the directors and executive secretary. Usually a minimum of 4 directors' meetings are held throughout the year. Special regional meetings may be called by the individual director at his discretion to discuss such local regional problems as insurance, regulations, insect infestations, new materials, public relations, etc.★★

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PEST ROUNDUP

This column, reviewing current insect control programs, is a regular feature of AGRICULTURAL CHEMICALS. Mr. Dorward is head — Plant Pest Survey Section, Plant Pest Control Branch, U. S. Department of Agriculture. His observations are based on latest reports from collaborators in the U.S.D.A.'s pest surveys throughout the U. S.

By Kelvin Dorward

'57 Insect Distribution Records

ALTHOUGH there was no spectacular spread of any one insect in 1957, numerous finds were recorded for the first time in various States. The spotted alfalfa aphid, which spread so rapidly after it was first reported in the U. S. in New Mexico in 1954, was reported from only one new State in 1957—Ohio. In that State this pest of alfalfa was reported from southwestern counties. The alfalfa weevil, long known to be in the western part of the United States, has spread rather rapidly in the east since being first found in New Jersey, Maryland and Virginia in 1952. It was reported for the first time in 1957 from three additional Eastern States: South Carolina, Connecticut and Massachusetts.

Two new cereal and forage insects were found in Louisiana during 1957, a clover weevil (*Hypera meles*) and the sweetclover aphid. The vetch bruchid was a new record for Illinois. California reported both the sweetclover weevil and Rhodes-grass scale for the first time and the velvetbean caterpillar continued its northward movement, having been taken in Delaware.

In New Mexico an aphid (*Asiphonella dactylonii*) was found on grass. This 1957 New Mexico record was also a first find for this insect in the United States.

The potato psyllid which causes the important psyllid yellows in potatoes and tomatoes was taken for the first time in Kansas. Another new record of an important vegetable insect was the finding of the pepper weevil in New Jersey.

Four forest insects reported in 1957 for the first time from Oregon were the birch leaf miner, the European alder leaf miner and two conifer aphids (*Cinara gentneri* and *C. schuhi*). The larch casebearer was a new pest in Idaho as were the spruce needle miner and a spruce aphid (*Cinara piceicola*) for California. In Illinois the mimosa webworm was reported for the first time in 1957 as was the Fuller rose beetle in Indiana.

In Utah an aphid (*Cavariella archangelicae*) on oak was a new pest record. This may also be a new record for the United States.

Interest created by the finding of the khapra beetle in three western States—California, Arizona and New Mexico—in 1953-54 has been responsible for an intensification of stored-products insect surveys. During 1957 the dermestid (*Trogoderma parabile*) and a tenebrionid (*Tribolium destructor*) were reported for the first time in the State of Washington. A dermestid (*Thylodrias contractus*) was a new record for California. In Idaho a new record was the grain moth (*Haplotinea ditella*). Evidently this is also a new record for the United States.

In Texas the termite (*Kalotermes approximatus*) was reported for the first time in 1957.

The insects reported upon do not include all the new state insect distribution records for 1957 but do illustrate the continuous spread of pests which emphasizes the need for constant vigilance against pests already known to be in the United States and the establishment of pests new to the country.

General Pest Activity

THE pea aphid was active on legumes from East to the West Coast by early May. Pea aphids were common throughout Delaware and Maryland and local heavy infestations were reported from Pennsylvania and Virginia. Heavy infestations were present in Georgia, Alabama and Tennessee. North Carolina, Illinois, Texas, Oklahoma, Kansas, Missouri, Louisiana and Nebraska were among some of the others reporting activity. In Utah populations were threatening in local areas. Nevada reported populations abnormally high in Clark and Nye Counties, with some control being applied. Light populations were present in Colorado and populations were building up rapidly in New Mexico. Build-ups were also reported from the Willamette Valley of Oregon.

The alfalfa weevil, a relatively new pest in the East, was causing damage by late April. Activity was reported from Pennsylvania, Delaware and Maryland. Damage in Virginia ranged from medium to heavy in most counties where the weevil is present. Unsprayed fields in Union and Wake Counties, North Carolina were a total loss from this weevil. Although reported from Georgia for the first time in 1958, the alfalfa weevil is known to be widespread in the State. In early May, eight Georgia counties reported light to moderate infestations and five moderate to heavy. Light injury was reported from the Boise Valley of Idaho and treatment was necessary in the central and

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Diamond Chemicals

northern areas of Utah. Adult control was required in Montrose County, Colorado.

The first armyworm larvae in Kansas were reported in early May. Armyworm moths were caught as far north as Lincoln, Nebraska and Urbana, Illinois and were active in the Richmond, Virginia area.

An outbreak of banded-winged grasshoppers (*Trimerotropis pallidipennis*) was occurring on 276,000 acres in Buckeye-Casa Grande area of Arizona. The species, which is normally not regarded as a serious pest, was moving from range to croplands and threatening young cotton. A cooperative control program has been completed with a total of 59,292 acres being treated for control of this pest. Heavy infestations have been reported also from southern Utah and Clark County, Nevada.

Aphids were among the most active fruit insects during late April and early May. In Indiana aphids were increasing on apples in the Orleans area and heavy populations were reported from apple trees in Lee County, Alabama. Extremely heavy aphid populations were damaging peach leaves in areas of New Mexico and Utah. Pennsylvania reported heavy population on apples in the south central area and Nevada and increasing populations on cherry in Washoe County. Catfacing insects were active in parts of Indiana, Illinois and Missouri.

Vegetable insects in general were rather light during this reporting period. Alabama, however, reported local damaging infestations of the vegetable weevil, turnip and cabbage aphids and the imported cabbageworm. Tomatoes in the lower Rio Grande Valley of Texas were being damaged by mites and tomato worms. Flea beetles were active in New Mexico and Oklahoma.

The principal cotton insect activity was in the lower Rio Grande Valley of Texas with fleahoppers and spider mites on the increase and bollworms causing some scattered damage. Thrips were on the build up in New Mexico and reported from Brownsville, Texas.

Diamond Offers 2,4-D and 2,4,5-T

As part of its expanding agricultural chemical sales and service program, Diamond Alkali Company, Cleveland, Ohio, announces the availability of low volatile six-pound ethyl hexyl esters of 2,4-D and 2,4,5-T to custom applicators of herbicides.

These high acid equivalent concentrates, an exclusive chemical development by Diamond, are said to make possible substantial cost economies and provide a number of other important advantages in weed and brush killing operations.

According to the manufacturer, low volatile six-pound ethyl hexyl esters of 2,4-D and 2,4,5-T now enable custom applicators to reduce on-the-job time and handling costs. They provide economy of use on an acid equivalent basis through reduced cost and increased utility of spray equipment.

Offering a wide range of application, these high acid equivalent concentrates may be mixed with water for an emulsion, with straight oil for an oil spray, or with a combination of oil and water. Of further interest is the fact that the emulsifiers incorporated in these six-pound materials make it relatively simple to reduce them to four-pound formulations, requiring only the addition of a suitable solvent.

Further information is available on request. Write to Diamond Alkali Company, Chlorinated Products Division, 300 Union Commerce Building, Cleveland 14, Ohio.

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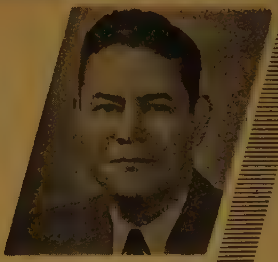
LISTENING POST

By Paul Miller



This department, which reviews current plant disease and insect control problems, is a regular monthly feature of AGRICULTURAL CHEMICALS. The comments on current plant disease problems are based on observations submitted by collaborators of the Mycology and Plant Disease Reporting Section, Plant Protection Research Branch, United States Department of Agriculture, Beltsville, Maryland.

Control of Botrytis in Stored Rose Stocks

G. J. STESSEL* reports results of laboratory and storage experiments conducted at the Rhode Island Agricultural Experiment Station in 1957, to evaluate various chemicals for effectiveness in controlling gray mold of dormant rosebushes in cold storage caused by the fungus *Botrytis* sp. The disease is a serious problem to commercial rose growers, frequently attacking barerooted roses stored in refrigerated vaults.

Laboratory Tests: The culture of *Botrytis* sp. used in the laboratory tests was isolated from a stored rosebush in February 1957. Nine chemicals were tested for capacity to inhibit growth of the fungus in potato dextrose agar. In tests with Captan 50W (50% captan), Vancide 51 (sodium dimethyldithiocarbamate; sodium 2-mercaptobenzothiazole), Thylate (65% thiram), and Kromad (5% cadmium sebacate, 5% potassium chromate, 1% malachite green, 0.5% auramine, 16% thiram), agar discs with *Botrytis* were planted in plates containing the chemical incorporated in agar, and the plates were incubated. For tests with the volatile chemicals ammonium carbonate, biphenyl, I-KI solution (2% iodine, 2% potassium iodide), dimethyl dichlorosuccinate, and sodium bisulfite, two agar discs containing the fungus were planted on agar in Petri plates with watch glasses holding the respective chemicals in the center, and the plates incubated.

Storage Tests: Fungicides used in the storage tests were Kromad, Captan 50W, Vancide 51, Thylate, Dowicide A (97% sodium-o-phenylphenoxide), Mycostatin (nystatin, 3550 units/mg), biphenyl, sodium bisulfite, ammonium carbonate, captan (7.5% dust), and Terraclor (pentachloronitrobenzene, 20% dust). Methods and concentrations are shown in Table 3.

In March 1957, Pillar No. 73 rosebushes that had been in cold storage for 3 months were treated. Only damaged areas and branch tips showed growth of *Botrytis*. Dead branches were cut off and the plants trimmed to 24 inches long. Nine bushes in bundles of three each were treated with each chemical. For dip treatments, bundles were held in the solutions for about 10 seconds, then drained and sealed in large polyethylene bags. For vapor treatments, chemicals were mixed with moist sawdust at the bottom of polyethylene bags. A rotary hand duster was used for applying dusts. After treatment the packaged rosebushes were stored 3 months at a temperature of 34° to 36° F. and average relative humidity of 90 per cent.

Table 1. Inhibition of Botrytis sp. by non-volatile fungicides in agar-biscuit tests.[a]

Chemical[b]	Inhibition[c]
Kromad	60
Captan 50W	100
Vancide 51	60
Thylate	60
Control (water-treated)	0
Control (untreated)	0

[a] Discs immersed 1 minute, 5 days incubation at 25°C.
[b] All chemicals at 6400 ppm concentration of commercial product.
[c] Based on number of discs out of five showing no growth.

When the plants were removed from storage the percentage of surface area covered by *Botrytis* was determined. The plants were pruned back to 6 inches and set out in the field. At the same time, 150 un-

(*Turn to Page* 127)

Table 2. Inhibition of Botrytis sp. by volatile fungicides in modified agar plate tests.[a]

Chemical	Concentration (grams per plate)	Growth[b]	Regrowth[b,c]
Ammonium	0.1	0	0
	0.01	2	4
Biphenyl	0.1	0	2
	0.01	0	3
I-KI solution	0.1	0	0
	0.01	3	3
Dimethyl dichlorosuccinate	0.1	2	2
	0.01	3	4
Sodium bisulfite	0.1	0	0
	0.01	2	3
Control	—	4	4

[a] Seven days' incubation at 25°C.
[b] Average of 3 plates. Rating scale: 4 = *Botrytis* growth covering entire surface of agar; 0 = growth.
[c] Five days' incubation after transplanting, rated against control.

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*G. J. Stessel, "Botrytis control in stored rose stocks," Plant Disease Reporter 42 (3): 396-398, March 15, 1958.

Shell Opens Expanded Modesto Lab.

SHELL Development Company in mid-April dedicated a new agricultural research laboratory in Modesto, California. The research center, located on a 142-acre experimental farm, has been expanded to consolidate facilities formerly located in Modesto and at Denver, Colorado. The center is now three times as large as the original research unit, which was opened in 1946.

Shell Development Company scientists at Modesto seek chemicals that will control insects, weeds, plant diseases and nematodes.

Dr. C. B. Hutchinson, mayor of Berkeley and formerly vice president of the University of California and Dean of the College of Agriculture at Davis, was guest speaker at dedication ceremonies attended by agriculturists from California and throughout the nation.

Doctor Hutchinson was introduced by Dr. Harold Gershinowitz, president of Shell Development Company, who pointed out that "in the fight against plant pests and diseases, the individual farmer, state and federal educational and research establishments and industry are banded together in a manner almost unique in our competitive society." The visitors to the new agricultural research laboratory were welcomed by Dr. K. E. Marple, director of the newly-enlarged facility.

Research at Modesto covers the broad range from pure research, through investigations of plant growth and behavior, to applied research aimed at the discovery of new agricultural chemicals for specific purposes.

Research projects in the biological sciences are carried on in plant physiology, plant pathology, entomology, and nematology. An organic chemistry group is primarily concerned with the synthesis of new compounds, and a physical and analytical chemistry section develops new formulations and conducts the important residue studies which are essential before an agricultural chemical may be marketed.

The physical plant includes ten buildings housing laboratories, administrative offices, a library, and a cafeteria. Adjacent to the laboratories are extensive greenhouses and lathhouses, and a general services building housing farm equipment needed for the experimental farm.

Modesto was chosen as the location for the agricultural laboratory because its climate provides a long growing season and is suitable for producing the wide range of crops needed in field testing. The extensive acreage is used as a proving ground for new agricultural products and permits scientific testing on a commercial scale.

In its initial years of operation, the Modesto laboratory developed many new products — defoliants, insecticides, nematocides, herbicides, and plant growth regulators—some of which are now commonplace on the farm.

Among the features of special interest at the Modesto laboratory are:

—A four-room insectary containing 2,000,000 insects of various species used in insecticide experiments.

—Ultra-sensitive equipment that can detect traces of a chemical as minute as one part in ten million in a farm crop or product. Authority from the federal government to market a product depends on the findings of such exact residue analyses.

—Radioactive tracer equipment which is used to learn more about the "mode of action" of plant nutrients and to follow their path and that of other agricultural chemicals as they are absorbed and move through a plant.

The Modesto Agricultural Laboratory is one of three major research establishments of Shell Development Company. The others are the Emeryville, California, Research Center which employs more than 1500 persons in a program of fundamental and applied research, and the Hudson Exploration and Production Laboratory where 500 employees are concerned with the study and development of improved methods of finding oil and for withdrawing it from the ground.

A plot of flowers is shown under test cultivation at the Modesto laboratory.

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TECHNICAL SECTION

Protective Treatment of Stored Grain

THE first of a series of reports presenting results of tests with various insecticidal dusts and sprays applied to stored grain for protection against insect attack is being offered by the Marketing Research Division, Agricultural Marketing Serivce, U.S.D.A.

The report was prepared by H. H. Walkden and Howard D. Nelson of the Manhattan, Kansas, Stored-Grain Insects Laboratory and summarizes the tests with methoxychlor made in the period from August, 1953 to December, 1956. At present, the tolerance for methoxychlor residues in stored wheat and shelled corn is 2 p.p.m. This level was established to cover any residues that might result from spraying empty grain bins with a residual type methoxychlor spray. No tolerance has been established as yet at levels to permit the use of methoxychlor dusts as discussed in the report.

The studies were conducted on wheat and shelled corn stored in the standard circular 3,250-bushel metal bins of the Commodity Credit Corp., U.S.D.A. After the protective treatments were applied, the grain was sampled monthly to determine the levels of insect population and moisture content, and quarterly for chemical residue analysis, bioassay tests, and commercial grade. In tests with wheat, the level of residue also was traced through the milling and baking processes.

Dusts applied to wheat in September and October 1955, at rates to give deposits of 5, 10, and 15 p.p.m. of methoxychlor, practically eliminated the insect populations present and kept the wheat almost insect-free through the following season until December 1956. However, when the results were tested for significance by the method of analysis of variance, the difference between the treated and check bins was not significant. The lack of significance was attributed to too short a period of comparison.

The amount of methoxychlor recovered from the wheat in December 1955 was 80, 64, and 45 per cent, respectively, of the amount applied to the 5, 10, and 15 p.p.m. treatments. In October 1956, at the end of the first year, 40, 45, and 35 per cent respectively remained.

The residues on other lots of wheat when received at the mill were less than one-half of the applied amount of 13.6 p.p.m. By the time the wheat had passed through the cleaning and tempering processes, the residues had been reduced to between 1.47 and 2.09 p.p.m. The largest portion of this remainder occurred in the feed fractions (bran and shorts) with small amounts in the second and first clear flours, and less than 0.5 p.p.m. in the patent flour.

The baking process did not destroy residues of methoxychlor but it reduced them by 21 to 44 per cent.

There was little change in the overall moisture content of the wheat, and there was no apparent effect on the behavior of the protective dusts. There were no changes in the commercial grade of the wheat during the period of the tests.

Dusts applied to shelled corn in August 1953 at rates to give deposits of 54 and 108 p.p.m. gave excellent protection through 1954 and 1955. The differences between the treated lots and checks were highly significant. These differences demonstrated that dosage levels of 54 p.p.m. and above were greater than needed for effective protection over the 30-month observation period.

Dusts applied to shelled corn in August 1954 at rates to give deposits of 36 and 54 p.p.m. gave excellent protection through the following year and until February 1956. The differences between the treated lots and checks were significant. These differences demonstrated that dosage levels of 36 p.p.m. and above were greater than needed for effective protection over the 19-month observation period.

Dusts applied to other lots of shelled corn in August 1954, in which the concentration of methoxychlor was varied but the amount was constant at 45 p.p.m., gave uniformly excellent protection against infestation through the following year and until February 1956. The differences between the treated lots of grain and the checks were not significant. The lack of significance was attributed to too short a period of comparison. It was necessary to terminate the tests so no further observations were made.

When test insects were confined on samples from the treated bins at quarterly intervals, the mortality produced gradually declined from quarter to quarter at about the same rate that the amount of residue, as indicated by chemical analysis, declined.

Analysis of the residues from 16 points in 1 bin of shelled corn revealed a high concentration in the center of the bin beneath the spout of the conveyor.

The moisture content of the samples indicated a continual transfer of moisture within the grain mass, but

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little change in the average for the bin. There was no apparent effect on the behavior of the protective treatment. There was an effect on the commercial grade in that 25 of the 43 bins under observation were downgraded from 1 to 5 grades because of increases in the amount of total damage which were attributed to moisture accumulation in the surface layer of corn. No downgrading was attributed to the protective treatments.

Five species of stored-grain insects were found in the wheat, the most abundant being the flat grain beetle. However, in corn 17 species were found. The rice weevil was the most abundant species in the bins receiving protective treatments, but was insignificant in the check bins, a situation that could not be explained.★

Aquatic Weed Control

An ideal environment for aquatic weeds exists in approximately 85 per cent of lakes and ponds in New Jersey, resulting in a major problem in both warm and cold water fisheries. Since 1951, the New Jersey Division of Fish and Game has conducted a research program, financed by Dingell-Johnson Funds, to test and evaluate scores of terrestrial herbicides in the control of aquatic vegetation.

Kuron, a product of the Dow Chemical Co., Midland, Mich., was found adaptable in the tests and seemed to offer as much control as did sodium arsenate. The initial experiments with Kuron were conducted on two lakes in northern New Jersey which were infested with water milfoil, fanwort, and water lily. The control of these species was considered to be complete. In the experiments, applications were made with a pack-type Indian pump or with a Bean estate sprayer. The chemical was diluted approximately 1-40 before application to the water surface from a flat-bottomed boat.

As a result of this work, Kuron seems to meet established criteria for aquatic weed control. It is harmless to humans, fish and other wildlife and is easy to apply. Residual effects, however, are still to be determined.

Control of Grape Pests

The results of research on grape pests in California, New York, and Washington strongly indicate that a single spray of parathion and DDT *just before the buds begin to swell* will clean up and give seasonal control of the important insects attacking grapes. These include cutworms, mealybugs, and leafhoppers. Of these three, only leafhoppers rapidly spread from vineyard to vineyard. Therefore, for seasonal control of leafhoppers it is important for neighbors to cooperate and all spray at about the same time. Control of other insects that hibernate in the vineyard, such as stink bugs, earwigs, and weevils, will be greatly aided by this delayed dormant spray.

For a cleanup spray for vineyards parathion is recommended at ½ lb. *actual* per 100 gallons (2 lb. 25% W.P., 1 qt. 2 lb. gal. emuls., or 1 pt. 4 lb. gal. emuls.) *plus* ¼ lb. *actual* DDT (½ lb. 50% W.P., 1 pt. 2 lb. gal. emuls., or ½ pt. 4 lb. gal. emuls.). Use 600 gallons per acre, use about 300 lbs. pressure, and thoroughly wet the bark of trunk and main leaders. If you use air carrier spray machines, use 3 lb. *actual* parathion plus 1½-2 lb. *actual* DDT per acre.

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*K. E. Frick, J. Keene, State College of Washington, Agricultural Extension Service, E. M. 1895, Feb. 1958.

Glycerine as a Soil Additive

Use of glycerine to improve soil characteristics is proposed in Australia, according to a recent report from the Glycerine Producers Association, New York City. They cite an Australian patent application covering use of glycerine, for this purpose.

Continuing, the brief report says: "The combination of a polyhydric alcohol and nutrients provides substantially greater benefits than either component when used separately. Of the compounds tested, glycerine was found to have the most beneficial effect on the soil areas tested. Glycerine is applied to the soil in the form of dilute aqueous solutions. It is then washed into the soil by the first rain and forms a layer, the position and width of which is dependent upon the soil. In this way it is possible to establish a moisture zone at a depth beneath the surface corresponding to the root growth. Experiments indicate that plants thus treated will give improved yields and require less rainfall."

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Sevin for Apple Pests

New Crag Sevin experimental insecticide, recently introduced by Union Carbide Chemicals Company, Division of Union Carbide Corporation, has been suggested for trial in the 1958 apple pest control schedule recommended by the New York State College of Agriculture.

The New York schedule suggests two pounds of Sevin 50% wettable powder per 100 gallons of spray mixture for control of insects early in the season.

In the summer program, the schedule lists Sevin 50% wettable powder at one pound per 100 gallons of spray for control of codling moth and green apple aphids.

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Describe New Herbicide

Investigations conducted at the Imperial Chemical Industries' Jealott's Hill Research Station, Bracknell, Berks, England, showed that aqueous solutions of 1:1'-ethylene-2:2'-dipyridylium dibromide applied as foliage sprays gave complete kill of wheat, sugar beet, white mustard, marigold, red clover, and cleavers. The investigations were reported by R. C. Brian, R. F. Homer, and J. Stubbs of Jealott's Hill Research Station and R. L. Jones of ICI's Pharmaceuticals division in *Nature*, 1958, 181, 446.

The compound was found to be highly active against species resistant to 2,4-D and MCPA — chickweed, groundsel, mayweed and speedwell. Russian thistle also was highly susceptible at ¼ pound per acre. In field trials, excellent potato haulm destruction was given by the new compound at one to two pounds per acre. Kill of common annual weeds, including fat hen, redshank, annual nettle, chickweed, and black nightshade was superior to that given by either sulphuric acid or sodium arsenate.

Main applications are likely to be potato haulm destruction, crop desiccation, and non-selective weed-killing.

Arcadian® News

Volume 3

For Manufacturers of Mixed Fertilizers

Number 6

We Appreciate Your Business

Good customers are the greatest asset of any company. Nitrogen Division, Allied Chemical, is proud of its customers in the fertilizer industry. The end of another fertilizer year is an appropriate time to say THANK YOU for purchasing your nitrogen requirements from us. We appreciate your business and will continue to do our best to deserve your confidence and your loyalty.

We produce for you the most complete line of nitrogen products available for manufacturing fertilizers. You have many different ARCADIAN® Nitrogen Solutions from which to select those best suited to your ammoniation methods and equipment.

Our plants at Hopewell, Virginia, South Point, Ohio, and Omaha, Nebraska, are conveniently located to serve many areas. We maintain the largest fleet of tank cars in the industry and do our utmost to keep our delivery facilities operating at top efficiency. When you need ammoniation advice or formulation assistance, you get it promptly without charge from our experienced technical service staff. The research that originated Nitrogen Solutions is constantly at work, developing new methods and materials to help you manufacture better fertilizers.

Your sales are supported by powerful advertising to sell mixed fertilizers. Farm magazine advertisements, radio broadcasts and billboards, sponsored by Nitrogen Division, Allied Chemical, carry the mixed fertilizer story to millions of farmers.

We look forward to a mutually pleasant and productive relationship with you during the years ahead. If you have suggestions as to how we can serve you better, let us hear from you. If you plan to be in White Sulphur for the Convention, stop by the Nitrogen Division, Allied Chemical, suite at the Greenbrier and let us tell you in person how much we appreciate your business.

Green fields speak as loud as big yields to many farmers. When the corn leaves lap in the row, the oats are shoulder-high, and the pasture is knee-high to cows, any farmer loves to show off his crops. That's a good time to go and see him, if he uses your fertilizer. It's also a good time to show his crops to other farmers.

One farmer applied a double dose of fertilizer to his corn by mistake. He made a big profit on the extra tonnage of silage produced by the extra fertilizer. But he didn't tell his neighbors about yields and profits. He told them how tall and green his corn grew during a dry season. He knew he made money from fertilizer. This was dramatized to him by the lush, green crop right before his eyes all summer.

It will pay you to take advantage of a farmer's pride in a good crop grown with your fertilizer. He can be an excellent salesman and demonstrator for you. Farm calls, when crops are green and growing, can produce plenty of success stories. The best way to tell these success stories is to take other farmers to see them. This enthusiasm sells fertilizer.

Many farmers, who firmly believe that fertilizer pays, will never bother to measure yields to figure out their actual profits. One way to get them to measure yields is to conduct a contest. Then the chore of measurement becomes important. Getting him to check yields is important to you, because this stresses the benefit, not the price, of fertilizer.

Every good farmer likes to grow good crops. Every good farmer likes to look at good crops. Take advantage of these two powerful urges this summer. It's as good as golf for getting a fertilizer man out into green fields and sunshine. And it probably makes a lot more money!

Arcadian News *for Fertilizer Manufacturers . . . . from* **NITROGEN DIVISION**

IN THIS WORLD
by Gretter
WHEN BUFFALOS ROAMED THE WEST, THE WHOLE PRAIRIE WAS THEIR RANGE...
BUT OUR CATTLE MUST FEED ON THE SAME PASTURE YEAR IN AND YEAR OUT... AND THE GRASSES ARE GROWING THIN FROM INTENSIVE GRAZING!
EROSION CAN BE PREVENTED...
TODAY, A FERTILIZED PASTURE PRODUCES 4 TO 5 TIMES AS MANY POUNDS OF BEEF AS AN UNFERTILIZED PASTURE... WHY? FERTILIZATION GREATLY INCREASES GROWTH AND PROTEIN CONTENT OF GRASS.
W
FERTILIZER GIVES SOIL THICK, VIGOROUS GRASS COVER... PREVENTS FORMATION OF GULLEYS AND SOIL LOSS BY EROSION.

Here is another Nitrogen Division, Allied Chemical, service to the fertilizer industry. This is one in a series of educational news features now being released to more than 1,000 newspapers reaching more than 5,000,000 subscribers.

NOW is the time to sell PASTURE FERTILIZERS

Livestock farmers are making money today and the biggest net profits are being made where pastures are well fertilized to feed the animals at low cost. These cud-chewing harvesters save lots of labor, and get top feed value out of the lush crops they pick up and stow away.

Pasture improvement is a good market to provide sales and profits for fertilizer men between row-crop rush seasons. Good farmers fertilize pastures several times a year. Right now, in June, after the first spring flush of growth and grazing is gone, is a good time to fertilize pastures to produce green feed for summer. This is true for both permanent pastures and special summer grazing crops.

High-nitrogen mixed fertilizers are the most practical and profitable product to make pastures make money for farmers and fertilizer men. Pastures used to get nothing but a little manure. Then they got some superphosphate. Practical farmers also used straight nitrogen. They tried low-nitrogen mixed fertilizers, and then they found that mixed fertilizers, like 10-10-10, gave even better results. Progressive farmers have been getting exceptional grazing with high-nitrogen fertilizers in the 2-1-1 ratio, either in mixed fertilizer alone, or as mixed fertilizer plus nitrogen top-dressing. It will pay you to promote 2-1-1 ratio fertilizers, and get the entire sale in one bag.

Actually, pasture grass is like corn in its plant food needs. Because corn is actually a grass, you can see how this makes sense. Corn needs 160 pounds of nitrogen, plus 80 to 120 pounds of phosphate and potash per acre to make a 100-bushel crop. Pasture grass can produce just as much feed per acre as corn. But, to do it, pasture grass needs as much plant food as corn. High-nitrogen mixed fertilizer is good corn fertilizer; it is also good pasture fertilizer. You'll make money—and friends—by selling 2-1-1 and 1-1-1 fertilizers for grass.

Corn is the biggest fertilizer user among all crops today. But pastures offer the biggest potential for fertilizer sales. Every section of the country has pastures, and all pastures need fertilizer. There are more acres of pasture and hayland than of any other crop. Some of your customers know it pays well to give pastures plenty of fertilizer. They can help you sell their neighbors. Pasture tours this summer can fill your dealers' stores with customers in the off season. Here are some typical results, telling the story of pasture profits with high-nitrogen mixed fertilizer—

"Native pasture with no lime or fertilizer produced the feed equivalent of 1,000 pounds of grain per acre. With lime and fertilizer, an acre of pasture produced the equivalent of 2,400 pounds of grain."

"Grass, with 250 pounds of 12-12-12 per acre, produced beef gains at a cost of 7 cents per pound. With the equivalent of 150 pounds of 18-12-12 per acre, this grass produced beef at a cost of 5½ cents per pound."

"Mixed pasture, fertilized with plenty of nitrogen, phosphorus and potash, gave high-producing cows everything they needed for top milk flow. One cow produced 4,600 pounds of milk in 84 days on this pasture alone, without losing weight."

"Plenty of 1-1-1 ratio fertilizer (500 pounds of 12-12-12 per acre) more than doubled pasture yields, with dry weight recorded at 3 tons per acre. Fertilizer averaged $18 per acre, and profit, over fertilizer cost, $63 per acre."

"Heavily-fertilized grass, getting 400 pounds of nitrogen in a 4-1-1 ratio fertilizer, produced 8,900 pounds of dry weight feed per acre, containing 1,790 pounds of protein. The grass averaged more than 20% protein."

Technical Tips

PROPERTIES OF SUPERPHOSPHATE THAT INFLUENCE AMMONIATION

The properties of superphosphate which have an important influence on ammoniation are: particle size, free acid content, water content, and porosity.

Small particle sizes will absorb more ammonia than large particle sizes. When the particles of superphosphate are irregular in size, the larger sizes may absorb only half as much ammonia as the smaller sizes. Under plant conditions, ammonia may penetrate to the center of particles no larger than 40-mesh, but at 30-mesh and larger there is much less ammonia take-up.

Ammonia take-up is also reduced when agglomeration of all ingredients has begun before all the ammonia has been added. Ammoniation cannot occur when the superphosphate is imbedded so deeply in the pellet that it is beyond the reach of the ammonia.

In most superphosphates, the influence of free acid on ammoniation can be accurately calculated. 20% superphosphate with a high acid content will absorb about 0.6 pound more ammonia per unit of P_2O_5 than superphosphate with a low acid content will absorb.

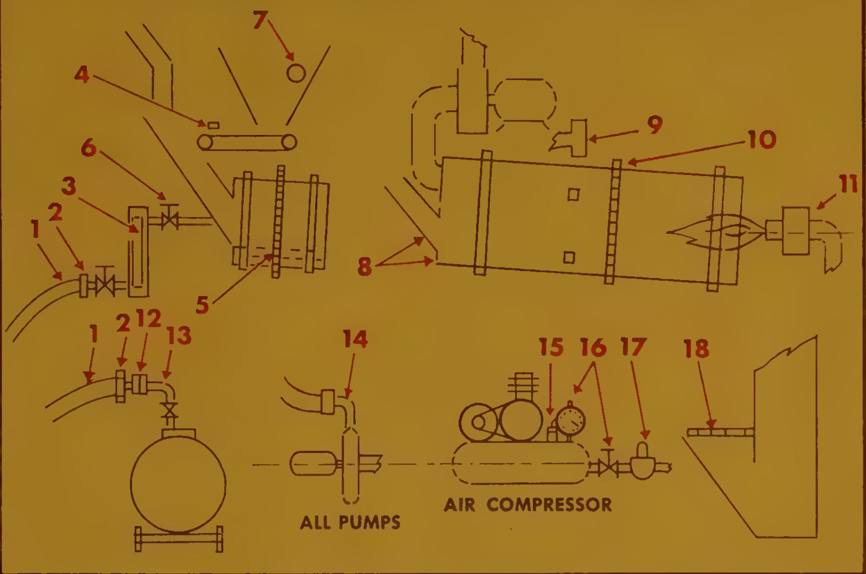
The amount of water in superphosphate or in the total mixture has some direct influence on ammoniation. Indirectly, it can have an important influence. The velocity of absorption of ammonia drops off if the moisture content of superphosphate is below about 40%. On the other hand, excessive moisture in the mixture may result in premature granulation or agglomeration, thereby retarding absorption of ammonia.

The long-held ammoniation rate of 3 pounds of ammonia per unit of P_2O_5 in 20% superphosphate was low because of equipment and techniques and not because of properties of superphosphates. Ammoniation rates were more than doubled when simple changes were made to permit uniform mixing of the ammoniating medium as it enters the mass and also to provide for reacting the ammonia gas that is generated as the temperature of the mass increases.

One unit of P_2O_5 in 20% superphosphate has been made to readily accommodate 5½ to 6½ pounds of free ammonia, without the aid of acid or the loss of nitrogen. Much good fertilizer is being made with ARCADIAN® Nitrogen Solutions supplying 1 unit of nitrogen for each 2 units of P_2O_5.

Triple superphosphates have shown an ability to absorb from 50 to 60% as much ammonia per unit of P_2O_5 as does 20% super, or from 3.5 to possibly 4.0 pounds of ammonia per unit of P_2O_5.

IT PAYS TO CHECK YOUR EQUIPMENT



CHECK NOW

Here are some of the points to check to insure efficient operation and safeguard men and machinery:

Repairs	OK	
☐	☐	1 Hose and pipe for wear or corrosion. Note condition of supports.
☐	☐	2 Hose and pipe connections. Are they secure? Are they stainless steel?
☐	☐	3 Condition of float in rotometers.
☐	☐	4 Accuracy of all weighing equipment including rotometers.
☐	☐	5 Distributor pipes for corrosion and wear.
☐	☐	6 Valves for leakage on lines handling solutions and acids.
☐	☐	7 Material bin indicator.
☐	☐	8 Drying, cooling and ventilating equipment for air leaks, corrosion and dust accumulation.
☐	☐	9 Beaters on driers, mixers and other equipment for excessive wear.
☐	☐	10 Condition of guards on belts, chains, gears and all moving parts.
☐	☐	11 Burner unit and controls on dryer equipment for leaks and proper adjustment.
☐	☐	12 Unloading hose connections. Especially note conditions of threads.
☐	☐	13 Hose kinks. Use elbows to eliminate connections where hose kinks might appear.
☐	☐	14 Hose pressure. Test hose for at least double normal working pressure.
☐	☐	15 Air receiver. Drain and make sure filter is given adequate maintenance.
☐	☐	16 Air receiver, safety valve, pressure gauge and shut-off valve for corrosion and operating condition. Replace if necessary.
☐	☐	17 Pressure regulator. Be sure it is operating properly.
☐	☐	18 Condition of grill over pits. Also check ladders and stairways.

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When you purchase your nitrogen requirements from Nitrogen Division, Allied Chemical, you have many different nitrogen solutions from which to select those best suited to your ammoniation methods and equipment. You are served by America's leading producer of the most complete line of nitrogen products on the market. You get formulation assistance and technical help on manufacturing problems from the Nitrogen Division technical service staff. You benefit from millions of tons of nitrogen experience and the enterprising research that originated and developed nitrogen solutions.

	CHEMICAL COMPOSITION %						PHYSICAL PROPERTIES		
	Total Nitrogen	Anhydrous Ammonia	Ammonium Nitrate	Urea	Water	Neutralizing Ammonia Per Unit of Total N (lbs.)	Approx. Sp. Grav. at 60°F	Approx. Vap. Press. at 104°F per Sq. In. Gauge	Approx. Temp. at Which Salt Begins to Crystallize °F
NITRANA®									
2	41.0	22.2	65.0	—	12.8	10.8	1.137	10	21
2M	44.0	23.8	69.8	—	6.4	10.8	1.147	18	26
3	41.0	26.3	55.5	—	18.2	12.8	1.079	17	-25
3M	44.0	28.0	60.0	—	12.0	12.7	1.083	25	-36
3MC	47.0	29.7	64.5	—	5.8	12.6	1.089	34	-30
4	37.0	16.6	66.8	—	16.6	8.9	1.188	1	56
4M	41.0	19.0	72.5	—	8.5	9.2	1.194	7	61
6	49.0	34.0	60.0	—	6.0	13.9	1.052	48	-52
7	45.0	25.3	69.2	—	5.5	11.2	1.134	22	1
URANA®									
6	42.0	19.5	66.3	6.0	8.2	9.3	1.178	10	34
10	44.4	24.5	56.0	10.0	9.5	11.0	1.108	22	-15
11	41.0	19.0	58.0	11.0	12.0	9.2	1.162	10	7
12	44.4	26.0	50.0	12.0	12.0	11.7	1.081	25	- 7
13	49.0	33.0	45.1	13.0	8.9	13.5	1.033	51	-17
15	44.0	28.0	40.0	15.0	17.0	12.7	1.052	29	1
U-A-S®									
A	45.4	36.8	—	32.5	30.7	16.2	0.925	57	16
B	45.3	30.6	—	43.1	26.3	13.5	0.972	48	46
Anhydrous Ammonia	82.2	99.9	—	—	—	24.3	0.618	211	—

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Extensive tests in more than 100 federal, state and Canadian experiment stations have indicated that Kelthane controls a wider spectrum of mite species than any other miticide, according to the Rohm & Haas Co., Philadelphia, manufacturers of Kelthane. Kelthane is available as a wettable powder, an emulsifiable concentrate or as mixed dusts. It is compatible with most typical spray materials.

* * *

Nitrogen's Effect On Peaches

Some of the effects of nitrogen fertilization on fresh-market quality of freestone peaches have long been recognized as delay in maturity, lack of red pigmentation, and retention of green color well into softening of the fruit. Growers therefore, have been cautious in applying nitrogen, even though high applications may more than double yields over those obtained when nitrogen is applied only to correct visible deficiencies.

A report in the April, 1958 issue of *Food Technology* describes studies involving an improved sampling distribution of treatments in high-nitrogen range, a more precise organoleptic evaluation of flavor and flesh character, and chemical analysis of green pigments and total carotenoids.

Nitrogen content of the leaves was used as the index of nitrogen status in the tests. Nitrogen fertilization in the range studied delayed the maturity of the fruit by as much as two weeks but did not appreciably affect the distribution or range of maturity on individual trees. Less susceptibility to bruising was noted among individual fruits from high-nitrogen treatments when harvested at comparable firmness to low-nitrogen treatments.

Firmness was found to be a good index of maturity in terms of time that would be required in post-harvest ripening for the fruit to reach canning ripeness, within the nitrogen range studied. Skin color was found to be a poor index of maturity. No significant differences due to nitrogen were observed in green pigments or total carotenoids of the flesh at the time of harvest. Rd values increased slightly and saturation values decreased slightly in the flesh of the harvested fruit as nitrogen increased.

The quality of canned peaches improved with increasing leaf nitrogen content. The relation between leaf nitrogen and subjectively determined quality factors was accompanied by a marked decrease in tannin and acid content of the ripened fruit as leaf nitrogen increased.

* * *

Orchard Studies on Organics

Studies on the effect of organic insecticides on parasitism of the oriental fruit moth (*Grapholitha molesta* (Busck)) were made from 1948 through 1953 in peach orchards near Moorestown, N. J. In orchards not receiving such insecticides parasitism of twig-infesting larvae of the first two generations was as high as it was before they came into general use. It was highest in the orchard groups where there was no exposure and lowest in those having a heavy exposure to these insecticides. Significant reductions in parasite levels did not always follow heavy exposure to these insecticides, and after spray applications were discontinued for the season, both moth and parasite populations usually regained normal levels within a few weeks. The average reduction in parasitism, even in orchards heavily exposed, was usually less than 50%.

Only the sprays applied before July 10 directly affected parasitism of the twig-infesting larvae. These included the early sprays used on peach, such as BHC, DDT, and the phosphorus insecticides used for control of the plum curculio or the oriental fruit moth, and similar sprays used on adjoining crops and orchards. There were instances in individual orchards of greatly reduced parasitism following moderate to heavy exposure to each of them. H. W. Allen, *Journ. Econ. Entomology* 51, No. 2, p. 81, 1958.

LITERATURE AVAILABLE

Mississippi Crop and Fertilizer Recommendations. A 16-page bulletin of general crop and fertilizer recommendations based on the latest research findings at the State College and the ten branch Experiment Stations in the state. This report presents information on fertilization varieties, and rates and dates of seeding for crops generally grown in Mississippi, Circular 212, Jan. 1958, Agricultural Experiment Station, State College, Miss.

AC

1958 spray recommendations for tree fruits in eastern Washington. The spray programs in this bulletin are based largely on results of experiments in which spray guns were used with portable and stationary machinery. The concentration and amount of spray can be varied, however, if a more rapid method of application is used. Extension Bulletin 419, Revised Jan. 1958. Extension Service, State College of Washington, Pullman, Wash.

AC

Handbook of citrus diseases in Florida by L. C. Knorr, R. F. Suit, and E. P. DuCharme. A 157-page, illustrated booklet that is concerned chiefly with the troubles of citrus that are caused by diseases. Among the infectious organisms described are fungi, bacteria, viruses, nematodes, and parasitic seed plants. Bulletin 587, June 1957, University of Florida, Agricultural Experiment Station, Gainesville.

AC

Control of fruit insects and diseases in orchards and home plantings by W. J. Heuberger, Donald MacCreary, R. F. Stevens. The 1958 spray schedules for Delaware covering apples, grapes, and peaches. Extension Folder 48 (revised) Jan. 1958, Agricultural Extension Service, U. of Delaware, Newark, Del.

AC

Insect and disease control on vegetables by Donald MacCreary, J. W. Heuberger, R. F. Stevens. Delaware's 1958 control recommendations. Extension Folder 49 (revised), Jan. 1958, Agricultural Extension Service, U. of Delaware, Newark, Del.

AC

Suggestions for Fly Control in Poultry Establishments, prepared by the Insects Affecting Man and Animals Research Branch, ARS, USDA. A discussion of fly control with dry and liquid baits, surface and space sprays, fly cords, and larvacides in poultry houses. ARS-33-45, Feb. 1958, USDA, Washington, D.C.

AC

Household insects and their control, by David H. Brannon. A review of household insects, the damage each causes, and specific control measures for each insect. Extension Service, State College of Washington, Pullman, Wash.

WACA Members Review New Herbicides, Outlook for Pesticides in West, and Production

by Charles Starker

A CAPACITY crowd of 155 industry representatives and invited guests from State and Federal Agricultural Research and Regulatory bodies attended the spring meeting of the Western Agricultural Chemicals Association at the Hotel Biltmore, April 22, in Los Angeles. A feature of the morning business session was the presentation of a gold pocket watch to A. F. Kirkpatrick, American Cyanamid, as a token of appreciation for the time and effort given by him to the Association during his terms as president in 1956 and 1957.

Weed Control

"Investments in weed control in the West pay off well in grower benefits," lead-off speaker Dr. Boysie Day, assistant plant pathologist, Citrus Experiment Station, Riverside, stated. The average savings on 2,4-D applied to wheat for weed control are $5.00 per acre; multiply this figure by 70% of the total Western acreage treated, and the net figure is some 40 million dollars. Another 26 millions may be added from savings with similar uses on barley, oats and rye. Bermuda grass in Southern California orchards, if controlled, should give returns of 100% on control costs the first year in savings on water consumption alone, Dr. Day believes.

While we have had the 2,4-D type materials for some 12 years, the potentials of this group have not been fully exploited, and many are only now being examined closely. New chemical tools such as Dalapon and amino triazole are currently filling in gaps in the weed control picture. Dalapon has replaced TCA very successfully for grass control, and its uses will be expanding. Amino triazole is very effective for control of certain noxious perennial weeds, such as Canada thistle, white top, and cattails.

Fenuron, one of the substituted urea compounds, is applied in pelleted form by air to the root zone of brush; moisture then leaches it into the soil where it is taken up by the roots. It effectively controls oak and many brushy weeds, but leaves native grasses unharmed. Neburon, another of this group, appears to be of considerable value to nursery crops for general weed control.

Randox and Vegadex give control of germinating seeds of annual grasses and most broad-leaved weeds in many vegetable crops. Simazine, while generally very toxic to most vegetation, does not affect corn. California work indicates that citrus and possibly avocados are quite resistant to it, even at rather high rates. Polychlorinated benzoic acid formulations have shown outstanding ability to kill wild morning glory, Russian knapweed, and certain other hard to kill weeds. The butyric acid derivatives, gamma 2,4-D butyric and gamma MCP butyric, are quite selective, being tolerated by many legumes which are very sensitive to most selective herbicides. They are unharmed by these materials, which at the same time are lethal to many broad-leaved weeds. Soil fumigants such as Vapam, Mylone, and Eptam show great promise for weed control in the western states.

Future herbicides will be more selective, Mr. Day believes. On large volume crops, compounds selective enough to eliminate certain weeds would be ideal; but on vegetable crops materials of more general activity would be needed, he concluded.

Future of Western Agriculture

"Agricultural chemicals are a vital part of Western agriculture," J. Earl Coke, vice-president for agriculture, Bank of America, San Francisco, told the group. If all salesmen for pesticides and fertilizer took a 1-year vacation, there would be no surplus problem in this country. We would be faced with a different sort of problem.

The future outlook for the West is good, population increases in the West estimated as follows: Arizona 51%, California 36%, Oregon 28%, Utah 28%, Washington 21% and Idaho 16%. The result will be a big Western market, growing twice as fast as the rest of the nation. Less competition from unfavorable markets and high freight rates are added favorable factors. Western agriculture is presently dependent on more distant markets, with vegetables and fruits exported to world markets, and the rest of this country. As long as westerners continue to produce materials people want, the future will be good. By 1975 our wheat requirements will have caught up with present production; however, increases of 75% in citrus; 32% other fruits; 54% tomatoes; 34% milk and 40% eggs will be needed.

This constantly changing consumer demand is due to dietary changes — away from high calories to fruits, vegetables, and animal proteins. Add a 35-40% increase in population, and this will also influence future demands. Will we be able to produce the goods, or will there be shortages? The main question seems to be how to increase production and gear it to demand. USDA studies indicate that if present known production methods are used completely on all farms and ranches, the result would be a 25% increase in production. During the period of 1920 to 1957, per acre production on the nations' farms increased 50%; in some areas of the West, this increase was 250%. Western farmers use materials and other devices which are available, and apply them rapidly in their farming. In this way they have been able to increase production at a greater rate than has the balance of the country.

Production potentials increase as farm units become larger, making for more efficient production methods, using machines and management effectively; plus the use of chemicals and fertilizers as the necessary tools for production to meet the needs of the future, keeping the ultimate consumer in mind.

(*Continued on Page* 117)

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Clupak* paper Multiwall Bags: Tougher because they Stretch!

New, improved multiwalls made with the revolutionary Kraftsman Clupak stretchable paper are today's modern way to package your products. In storage, shipping and use, these bags take more handling punishment *without failing* because Clupak paper *stretches* under impact. This is TOUGHNESS, a new measurement of strength and value in multiwall bags.

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International Minerals and Chemical Corporation now offers a full line of *five major potash products* for agriculture, to meet the specific requirements of the fertilizer manufacturer.

The addition of a new granular muriate of potash for direct application is another step forward in our program of continuing to provide a *complete* service . . . for all your potash needs.

For consistent quality and flexible formulation, depend on this full line of potash products, backed by personalized sales and technical service from experienced people at your nearest district sales office . . . Atlanta, Ga., Chicago Ill., New York, N.Y., and Shreveport, La.

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NEWS about the TRADE

Riemer Leaves Nitro. Div.

Hugo Riemer, president, Nitrogen Division, Allied Chemical Corp., New York, left the company early last month. Mr. Riemer had been president of Nitrogen Division since June, 1952, when the division was formed.

He joined the legal department of Allied in 1935 after being affiliated with a New York law firm. He was named assistant to the president of Allied in 1945, becoming vice president and executive vice president in 1950.

Mr. Riemer has not revealed his plans for the future and, as of May 22, Allied had not appointed a successor. Well known in the agricultural chemical industry, Mr. Riemer represented his company in the National Plant Food Institute as a director and as a member of the NPFI executive committee.

•

Expand Diamond Sales

The Diamond Alkali Co., Cleveland, has announced a new, long-term sales and service program designed to broaden the company's position as a producer and marketer of agricultural chemicals.

The company plans to concentrate its sales and technical service activities in the agricultural chemicals field on Diamond 2,4-D and 2,4,5-T and their formulations, BHC, DDT, lindane, hexachlorobenzene, miticides, and grain fumigants. L. J. Polite Jr., sales manager of Diamond's Chlorinated Products Division, is directing the expanded program, assisted by James O. King, recently appointed manager of agricultural chemical sales.

•

Potter Elected V-C Chairman

Justin Potter has been elected chairman of the board of the Virginia-Carolina Chemical Corp., Richmond, Va., succeeding William C. Franklin, who resigned.

Mr. Franklin was named board chairman in September, 1956. In his resignation he stated that he had accepted the position "primarily to locate a capable management group." He added that he thought this had been accomplished.

Mr. Potter is chairman of the Cherokee Insurance Co. and a director of the Commerce Union Bank, both in Nashville, Tenn.

•

Western Co-ops Merge

The Western Fertilizer Assn., Salt Lake City, Utah, has consolidated its operations with the Central Farmers Fertilizer Co., Chicago.

W. H. Shidaker, vice president and director of divisional operations of the Farm Bureau Cooperative Assn., Chicago, and a member of the board of directors of the Central Farmers Fertilizer Co., said that the present members of Western will become members of Central Farmers and the consolidation will bring together the phosphate reserves of both organizations into a single operation. Central Farmers is constructing a mine and phosphate manufacturing plant at Georgetown, Idaho. Western has extensive phosphate reserves near Soda Springs, Idaho.

•

Ove F. Jensen To Retire

Ove F. Jensen, sales specialist on Uramon ammonia liquors for the fertilizer industry, will retire July 31 after a 25-year career with E. I. du Pont de Nemours & Co., Wilmington, Del.

Mr. Jensen joined Du Pont in 1933 as a sales representative for the old Ammonia Department, covering all the southern states. Dr. Philip B. Turner will succeed Mr. Jensen.

Geigy Marketing Agreement

Under an agreement recently concluded, the entire range of agricultural and horticultural products, apart from DDT, of the Geigy Co. Ltd., sole United Kingdom concessionaires of J. R. Geigy SA, Basle, will be marketed in the U.K. by Fisons Pest Control Ltd., London.

•

Buys Black Leaf Plant

United Co-Operatives, Inc., Alliance, Ohio, has purchased the physical assets and property of the Diamond Black Leaf chemical operation at Montgomery, Alabama.

United Co-Operatives' Farm Chemical Division plans to operate this plant in the production of Unico insecticides, fungicides, and mixed dusts.

•

Pesticide Supply Is Ample

The total supply of pesticides is expected to be ample in 1958, although some of the recently-developed pesticides, or those for special uses, could be in short supply, according to a report recently issued by the USDA.

The report, "The Pesticide Situation," was prepared by Harold H. Shepard of the Commodity Stabilization Service, Food and Materials Requirements Division, USDA. The report says that production of synthetic organic chemicals intended primarily for use in pesticidal preparations has grown steadily.

Production of pesticides, their rate of disappearance during recent years, and minimum crop requirements are among the statistics presented in the report. The 1957 year-end pesticide stock picture was shown on page 122 of the May, 1958 issue of *Agricultural Chemicals.*

IMC Names Ware, Ziegler

The board of directors of the International Minerals & Chemical Corp., Chicago, last month elected

T. Ware

J. Zigler

Thomas M. Ware president. He succeeds his father, Louis Ware, who was elected chairman of the board and chief executive officer.

Thomas M. Ware had been administrative vice president of the corporation. He joined IMC in 1947 as an industrial engineer and was named administrative vice president in 1955.

In addition, the firm has announced that John D. Zigler will head the Plant Food Division as general manager, following the resignation of Maurice H. Lockwood as vice president of the division, June 1. Mr. Zigler has been general manager of the division since 1956.

•

Entomology Club Outing

The New Jersey Entomological Club will hold its spring outing June 14th at the New Jersey State 4-H Camp, Stokes State Forest, near Branchville, N. J.

Anyone interested in entomology in any of its phases is invited to the outing which will include a short business meeting to discuss plans for promotion of entomology among youth entomological groups.

•

New Geigy Research Lab

New entomological research and chemical analysis laboratories for testing "Mitin" mothproofed fabrics have been completed at the year-old headquarters of Geigy Chemical Corp. at Ardsley, N. Y. The entomological laboratory, under the supervision of Don J. Ott, was until recently located at Bayonne, N. J.

•

N. C. Weed Meeting Dec. 3-4

The North Central Weed Control Conference will hold its fifteenth annual meeting at the Netherland Hilton, Cincinnati, Ohio, December 3-4, 1958.

•

Soil Treatment Movie

Stauffer Chemical Co., New York, have just produced a new sound-and-color 16 mm film which portrays how soil fumigation increases crop yields. Prints are available on loan to interested agricultural groups.

Modern methods of applying liquid soil fumigants are shown as well as a series of problem-and-solution sequences on control of specific weed and soil pests.

Off-Season Fertilization Report

A report on off-season fertilization has just been distributed by the NPFI committee, appointed for this study by Russell Coleman, NPFI executive vice president.

E. T. York, American Potash Institute, prepared literature on alfalfa; B. W. Gull, Spencer Chemical Co., reviewed blue-grass; Quentis S. Lee, Cotton Producers Association, reported on fishponds; U. S. Jones, Olin-Mathieson Chemical Corp., discussed side-dressing of soybeans with 6-24-24; and M. H. McVickar, California Spray Chemical Corp., reviewed rangeland fertilization operations.

The committee also distributed graphs showing the movement of fertilizer by months in the eastern U. S. and the far west. They also superimposed on the graph opportunities for the correct use of fertilizers at times of the year other than spring.

Plan for Southwestern Fertilizer Conference

The planning committee of the Southwestern Fertilizer Conference & Grade Hearing met in Shreveport early in May to discuss plans for the Southwestern Fertilizer Conference, July 16 to 19, at the Buccaneer Hotel, Galveston, Tex.

Stanley Hackett, president of the Dixie Fertilizer Co., Shreveport, will preside over the morning session on July 17. Dr. Russell Coleman, executive vice president of the National Plant Food Institute, and Dr. R. L. Beacher, director of the Southwestern Regional Office of NPFI, will present the NPFI program for the Southwest. They will bring recent findings of a survey made of dealers and farmers in the southwest and will suggest a plan to increase use of plant food.

An address will be presented by Clayton Rand of Gulfport, Miss., who is an editor, author, speaker and syndicated columnist. Mr. Rand recently was named one of the top ten convention speakers in the United States by the U. S. Chamber of Commerce.

Bob Linderman, International Minerals & Chemicals Corp., will be chairman of a golf tournament scheduled for the afternoon of July 17. A banquet and a dance are planned for that evening.

Dr. J. F. Fudge, state chemist for Texas, will conduct the annual grade hearing on July 18. Control officials from Arkansas, Louisiana, New Mexico, Oklahoma, and Texas will participate.

Members of the planning committee are: (left to right) Mitt Morehead, Olin Mathieson; Mrs. Hackett; Stanley Hackett, Dixie Fertilizer Co.; Mrs. N. D. Morgan; Dr. R. L. Beacher, NPFI; Mrs. Tom Wright; Dr. Russell Coleman, NPFI; Mrs. Mitt Morehead; Tom Wright, Texas Farm Products Co.; Mrs. Harold Trammell; Harold Trammell, Farmers Fertilizer Co.; Jimmy Powledge, National Hotels; and Dr. N. D. Morgan, Amer. Potash Inst.

Glick Joins PCA

Russell L. Gulick has been appointed sales representative for Florida by the

Potash Company of America, Carlsbad, N. Mex. He will make his headquarters in Atlanta, Ga., and will work in conjunction with Paul C. Ashley of the Orlando, Fla, office.

See Sulfur Price Rise

The *Wall Street Journal* last month quoted Jefferson Lake Sulphur Co., New Orleans, as saying that the price of sulfur is likely to rise in the not too distant future.

The company said that the sulfur market gives every evidence of stabilizing and they have no reason to believe that demand will decline appreciably this year. Prices, however, are not expected to return all at once to the price level of $28 per ton they had reached before the price cut last September.

Allied Completes Plant

The Allied Chemical Corp., New York, has announced completion of manufacturing facilities for the formulation of emulsifiable insecticides at the Minneapolis plant of its General Chemical Division.

Products to be formulated at the new plant include DDT, heptachlor, aldrin, dieldrin, endrin, and toxaphene. The plant will serve General Chemical Division's customers in the upper mid-west.

Heptachlor For Argentina

The Velsicol Chemical Corp., Chicago, has shipped 150 metric tons of technical heptachlor to Argentina. The Argentine Ministry of Agriculture will use a substantial part of the heptachlor to control grasshoppers.

Liquid Warehousing Facility

The Memphis Mixed Products Terminal Corp., Memphis, Tenn., is offering a liquid warehousing facility on an 11-acre site in Memphis Harbor on President's Island. The facility can be used as an accumulation or distribution point for liquid fertilizers.

Rail, barge, and truck line services are available direct to storage tanks which accommodate 600,000 gallons of liquid each. According to the company, this is the first time that a tank farm operation has been made available to distributors, manufacturers, and shippers on a lease basis.

Joins NATA Washington Staff

Robert E. Monroe has joined the Washington staff of the National Aviation Trades Association as assistant to executive director Charles A. Parker.

Mr. Monroe will aid in NATA's study of the problems of the fixed base operator and aerial applicator industry. Special attention will be given by Mr. Monroe to matters pertaining to agricultural aviation, maintenance and the NATA Annual Convention. He formerly was vice-president and chairman of "Agricultural Activities" of NATA and had been president of the Montana Aviation Trades Association.

USDA Spray For CCC Bins

The U. S. Department of Agriculture has purchased 1,065 gallons of malathion emulsifiable concentrate from the Thompson-Hayward Chemical Co., Kansas City, Mo., at a delivered price of $7.32 per gallon. The concentrate will be used as a protective spray against insect infestation in Commodity Credit Corporation-owned grain in CCC bins.

This quantity will be sufficient to treat approximately 8.5 million bushels of grain. CCC-owned grains stored in bins in Illinois, Indiana, Iowa, Kansas, Minnesota, Missouri, Nebraska, Ohio, and South Dakota will be treated.

APC Absorbs Lindsay Co.

The Lindsay Chemical Co., West Chicago, Ill., has become the Lindsay Chemical Division of the American Potash & Chemical Corp., Los Angeles, under the provisions of a merger approved by the shareholders of both companies April 29.

Merger terms include the exchange of common stock on a share for share basis. Lindsay is a producer of thorium, yttrium, and rare earth chemicals. Its sales in 1957 were $8,952,563.

Kennel Joins Pennsalt

Robert Kennel has joined the agricultural chemicals sales staff of the Pennsalt of Washington Division, Pennsalt Chemicals Corp., Tacoma, Wash. He had been engaged in selling agricultural chemicals in the Northeastern section of the U. S. for five years before joining Pennsalt.

Mr. Kennel now is Pennsalt's representative for New York and adjoining areas. His office is at Port Jefferson, N. Y.

K-State Systemic Conf.

The third work conference on systemic livestock insecticides was held at Kansas State College, Manhattan, May 26 and 27, under the sponsorship of the entomology research division of the USDA and the medical and veterinary section of the Entomological Society of America.

More than 100 entomologists and industry representatives attended the meeting and heard discussions of research now underway, presentations of research data, and plans for coordinated research on new problems. C. C. Roan, K-State entomologist, was in charge of local arrangements. The first two such conferences were held at Kerrville, Texas.

Zipse Joins Brokerage Firm

Robert J. Zipse has joined the brokerage firm of Pennington, Colket & Co., New York, as a general partner. Mr. Zipse formerly had been with the Olin Mathieson Chemical Corp. and the Geigy Chemical Co. as agricultural chemicals sales manager.

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Magcobar can furnish a carrier of the desired type, grade, and particle size, either pulverized or granular, to meet the requirements for any insecticide formulation. In granular carriers, for example, Magcobar offers a thoroughbred team of three products: CARRICLAY, PULGITE, and ARROWHEAD.

CARRICLAY, Magcobar's LVM grade Attapulgite, is ideal for the formulation of high concentrate granulars where a slow toxicant release is desired.

PULGITE, the RVM grade Attapulgite, is the preferred carrier for high concentrate granulars where more rapid toxicant release is desired.

ARROWHEAD granular bentonite is ideal for economical low concentrate formulations and is the preferred product for 5% DDT granulars used in corn-borer control.

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DI

Zeitlin Joins Emulsol

Jack Zeitlin has joined the sales staff of the Emulsol Chemical Corp., a division of Witco Chemical Co., New York. Mr. Zeitlin makes his headquarters in New York and covers the East Coast territory together with Graham Barker.

Mr. Zeitlin formerly was with the General Dyestuff Corp. in the technical sales service laboratory.

■

Fertilizer Group To Meet

The annual meeting of the National Joint Committee on Fertilizer Application will be held in conjunction with the American Society of Agronomy on Aug. 4 at Purdue University, Lafayette, Ind.

B. A. Krantz, University of California, Davis, will preside over the meeting which will include a field trip to fertilizer placement demonstrations and an exhibit of fertilizer placement machinery. A panel discussion of band seeding will be moderated by George Enfield, USDA, Washington, D. C. R. L. Cook, Michigan State U., East Lansing, will discuss fertilizer placement for small grains.

The uptake of nutrients as influenced by their placement will be discussed by A. J. Ohlrogge of Purdue. W. L. Nelson of the American Potash Institute will tell of some principles of fertilizer placement in a talk based on a slide set prepared for educational use.

•

4th Cornell Weed Day

The fourth annual Cornell Weed Day will be held this year in conjunction with the meeting of the Northeast Branch of the American Society of Agronomy, to be held July 13 to 16, at Ithaca, N. Y.

Included in the sessions will be field trips to research farms and sectional papers on crops, soils, and weeds.

•

Allied Builds In Florida

Nitrogen Division, Allied Chemical & Dye Corp., New York, is installing two large-volume nitrogen solution storage terminals in Florida. Both terminals will store Urana and Nitrana solutions and will be located on the St. John's River, one at Jacksonville, the other at Sanford.

Nitrogen solutions will be shipped to the two terminals by barge via the Inland Waterway from the division's manufacturing plant at Hopewell, Va. Shipment from the terminals to customers will be by rail and tank truck.

Work on both the terminals is scheduled for completion in late summer.

Fischer Joins Fulton

Kenneth R. Fischer has been appointed to the sales staff of Fulton Bag & Cotton Mills of Atlanta, Ga. Working out of St. Louis, Mr. Fischer will cover Missouri, Tennessee, Arkansas, Nebraska, Kansas, Southern Iowa, and Western Illinois for the Textile Division of the 90-year-old company.

The Fulton Bag & Cotton Mills St. Louis headquarters is located at 2725 Clifton Avenue.

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For manufacturers merely wishing to cool and condition their fertilizers before going to storage, Blue V cooling units provide a dependable, economical, and efficient cooling operation. The cooling equipment can be incorporated into a complete granulation installation later.

Greeff Elects V.P.'s

Harry Y. de Schepper (l.) and Chas. E. Griffith (r.) have been elected vice-presidents of R. W. Greeff & Co., Inc., New York. Both have been with the company for over 20 years and are also members of the Board of Directors.

■

Downes Joins Conn. Station

William L. Downes Jr., an expert in the classification of flies, has joined the staff of the Department of Entomology at the Connecticut Agricultural Experiment Station for a period of six months. He will work on classification of unidentified material collected by the station and generally review the station's insect collection.

■

N. C. Changes Grade List

The North Carolina State Board of Agriculture last month made three changes in the official list of fertilizer grades for 1958-59.

The board substituted 0-18-36 for 0-20-40 and deleted grade 13-13-13 from the list for general crops. One grade, 4-18-12, was added to the list of approved grades for tobacco.

During a year beginning July 1, only grades on the approved list may be registered and sold in the state with the exception of one specialty grade which each manufacturer is allowed to register and sell.

●

New Texas Gulf Plant

The Texas Gulf Sulphur Co. has begun production of sulphur at its new Fannett Dome plant in Jefferson County, Texas.

The Fannett Dome, which is located 13 miles southwest of Beaumont, is the 25th Frasch process mine steamed since the beginning of the process in 1895. To date nine domes have been exhausted. The new plant will produce approximately one-half million tons of sulphur per year.

●

O-M Names General Manager

Frank J. Pizzitola has been named general manager, Chemicals division, Olin Mathieson International Corp. His headquarters are in New York.

Mr. Pizzitola formerly was an assistant to the vice president in charge of operations and had been associated with the Monsanto Chemical Co.

●

To Reorganize Re-Mark

Plans for a reorganization of the Re-Mark Chemical Co., North Miami, Fla., were announced last month by David H. Koppelman, head of a group of investors which he said intends to take control of the firm.

C. Gordon Anderson has been named trustee in the reorganization. Creditors of Re-Mark, a fertilizer manufacturing company which has been doing a gross business of more than $1,500,000 a year, filed a bankruptcy petition last month.

●

Stauffer Acquires Anderson

The Stauffer Chemical Co., New York, has acquired all of the outstanding stock of Anderson Chemical Co., Weston, Mich. Anderson will operate as a Stauffer subsidiary under the management of its founder, Amos R. Anderson as president. Anderson produces and markets a number of specialty chemicals.

■

PCA Names Arnold

The Potash Co. of America, Carlsbad, N. Mex., has appointed Fred G. Arnold as sales representative for the North Carolina, South Carolina, and Virginia territory. Mr. Arnold makes his headquarters at Raleigh, N. C.

For the past 18 months, he had been working out of the company's general sales office in Washington, D. C.

Pyrethrum Shipment by Air

Seven thousand pounds of liquid pyrethrum extract recently were delivered in a single shipment direct from Nairobi, Kenya, to International Airport, New York. The consignment was ordered by McLaughlin Gormley King of Minneapolis. It was supplied by the Pyrethrum Board of Kenya.

●

Revamp Technical Services

Chemical technical service activities of the Davison Chemical Co., division of W. R. Grace & Co., Baltimore, have been consolidated under F. Emerson Ivey Jr., as manager, to provide improved coordination and exchange of technical information and widened service.

Mr. Ivey reports directly to R. D. Goodall, vice president and general manager of chemicals.

●

Form Sulfur Export Firm

The Texas Gulf Sulphur Co., New York, and the Freeport Sulphur Co., New York, have formed a jointly owned subsidiary, Sulphur Export Corp., to handle marketing of sulphur by the two concerns outside North America.

Officials of the two companies said that they would invite other producers to join the venture. Sulphur Export had existed previously from 1922 until 1952. It was disbanded in 1952 and the two companies have since marketed their sulphur abroad themselves. The new company will be managed by Peter Black, president, and C. T. Hill, chairman.

American Equipment Furnishes Formosa Fertilizer Plants

WITH the help of aid funds from the United States, Formosa is rapidly enlarging its fertilizer industry in an effort to attain self-sufficiency. The 13,000 square mile island, 100 miles off the China mainland, supports a population of 10 million with an arable land surface of only 4,000 square miles.

Formosa's principal crops are rice and sugar, the latter accounting for more than half of the island's foreign exchange since 1945. Other crops grown are sweet potatoes, peanuts, pineapples, tea, bananas, and diverse vegetables.

In 1956, Taiwan spent $21,731,000 for 359,000 metric tons of imported fertilizers. Of this, 282,000 metric tons were ammonium sulphate purchases from Japan. The remainder was mostly calcium superphosphate from Japan and potassium chloride from Germany and France, plus small quantities of phosphate-bearing rock from Morocco and the U. S. Taiwan produced 311,000 metric tons of fertilizers herself in 1956.

Three government-owned fertilizer companies now are in operation on Formosa: Taiwan Fertilizer Co., the largest, with five plants in production and one under construction; Kaohsiung Ammonium Sulphate Works, at the southern tip of the island; and Hwalien Nitrogen Fertilizer Works, on the east coast.

The five plants of Taiwan Fertilizer Co. (TFC) produce 72,000 metric tons of calcium cyanamide; 85,000 metric tons of superphosphate; and 14,000 metric tons of fused phosphate per year. Kaohsiung produces 70,000 metric tons of calcium cyanamide per year, and Hwalien produces an equal quantity of nitrochalk.

(Continued on Page 85)

INTERORE

Your Mark of Integrity and Service
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Phosphate Rock
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NOW you can formulate high concentrate wettable powders at low cost with MICRO-CEL

SUBSTANTIAL FORMULATION SAVINGS

Micro-Cel*, a new line of synthetic calcium silicates, has extremely high absorptive properties. It is this remarkable capacity for absorption that makes it possible to prepare wettable powders with higher concentrations of dry, viscous or liquid poisons. Micro-Cel's absorption also means that more lower cost diluents can be used. Thus high strength formulation costs are now cut to a new low.

REMAINS FREE-FLOWING—MEETS STORAGE TESTS

With Micro-Cel, these high concentrates will remain in a free-flowing state even after prolonged storage. This is particularly important in producing poisons for the export market.

In addition, suspension values after storage of 1.5 to 2.0 I.C.A. have been achieved in 75% DDT wettable powders, based on Micro-Cel. This is more than adequate for storage conditions encountered in most tropical countries.

DEVELOPED BY JOHNS-MANVILLE RESEARCH

Micro-Cel is another development of Johns-Manville Research. Combining high absorption, large surface area, small particle size and excellent dry flowability, it offers a unique combination of properties for insecticide formulation and other process needs.

Sample quantities and carload shipments are now available. Write for further data and sample formulations for poisons of interest to you. Or ask a Celite engineer to help you adapt Micro-Cel to your particular requirements and specifications.

*Micro-Cel® is Johns-Manville's new absorbent-grinding aid designed specifically for the insecticide formulator.

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SYNTHETIC CALCIUM SILICATES
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Please send ☐ further information; ☐ samples of Micro-Cel. I am interested in using Micro-Cel with the following poisons:

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☐ Please have your local representative contact me.

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City__________ Zone______ State______

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For production of field strength dust or 12% dust concentrate. Factory-processed to flow freely and offer excellent grinding characteristics . . . to speed your production. Packed in 75-pound polyethylene paper bags for easy handling and storage. Warehoused at Wichita, Kansas and Macon, Georgia for fast delivery to you or convenient pickup by your own trucks.

HIGH GAMMA (36%–42%) BHC

Recommended for production of BHC wettable powders, dust concentrates, solutions and emulsions. Contract for your BHC from Frontier — and benefit from advanced quality control in one of the industry's newest plants . . . and fast, friendly Frontier service, backed by the resources of Vulcan Materials Company . . . your assurance of reliability.

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TFC's sixth plant (shown on Pg. 82) is expected to be in production this summer and will produce coated fertilizer urea and uncoated industrial grade urea. The plant is being built at Nankong, seven miles from Taipei, Taiwan's capital. It will have a capacity of 84,000 metric tons of coated urea.

All equipment, with the exception of two German-made compressors, will be American: gas producers from Wellman Engineering Co. of Cleveland; sulfur removal unit from Wilputte Division of Allied Chemical Corp., New York; air suppression unit, designed by Hydrocarbon Research, from Project Fabrication Corp., College Point, N. Y.; reversing exchanges in air suppression unit from Trane Co., New York; ammonia converters from A. O. Smith Co., New York; refrigeration system from Carrier Corp., New York; Horton sphere (for liquid ammonia storage) from Wyatt Metal Co. of Houston; two centrifugal compressors and eleven other reciprocating compressors from Clark Brothers, New York.

Also gauges, recorders and indicators from Foxboro Co., New York; most electrical equipment and steam turbines from General Electric International, New York; towers and vessels from Chicago Iron and Bridge Co. (converters, actifiers, etc.): urea process machinery from Vulcan Copper and Supply Co., Cincinnati; evaporator from Rodley Hunt, Boston; prilling tower from Vulcan (designed by Uhde Co. of Germany); urea finishing equipment (drier, duster, prill coater, cooler) from Bartlett and Snow Co., Cleveland; boiler plant from Combustion Engineering Co., Chicago; water treatment plant from Permutit Co., New York; water process pumps from Peerless Pump Co. division of Food Machinery and Chemical Corp., New York; pumps in urea plant, Allis Chalmers of Milwaukee; process pumps, United Centrifugal Pump Co., New York; water cooling tower, Fluor Co., New York; coal and coke handling system, Gifford Wood Co., New York; and prill tower, designed by Uhde, Puget Sound Fabricators, Seattle.

•

Soil Group Hears Boyce

Dr. Albert M. Boyce, director of the University of California Experiment Station, Riverside, told the sixth annual Fertilizer Conference in San Luis Obispo, Calif., April 14, that the mutual confidence on the part of both the fertilizer industry and the research stations has made for a better service to agriculture.

Also at the meeting, the 200 delegates visited a range fertilization demonstration on the Hearst Ranch in which the fertilization resulted in a net increase of 227 pounds of beef per acre last year. The net increased income per acre amounted to $41.94, due entirely to fertilization. The meeting was sponsored by the Soil Improvement Committee of the California Fertilizer Association.

•

North Central Weed Meeting

The North Central Weed Control Conference will meet at the Netherlands Hilton Hotel, Cincinnati, Dec. 3-4, 1958.

Heads Philadephia Plant

Francis J. Dunleavy has been named manager of the Philadelphia plant of the Yale Materials Handling Division of the Yale & Towne Manufacturing Co. He had been assistant general manager of the plant since November, 1956.

Besides the Philadelphia plant, the division maintains manufacturing facilities in San Leandro, Calif., and Forest City, Ark.

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"TAKO" Airfloated Colloidal Kaolinitic Kaolin is practically a chemically pure inert colloid with exceptional qualities and excels as a diluent-carrier in formulations of insecticides-pesticides. It gives increased workability—dispersion in formulations, its purity is highly desirable due to its compatibility with chemicals, its colloid properties give increased toxic action—greater adhesive-adsorptive properties.

Non-Abrasive—Non Hygroscopic—Non Caking—Free Flowing

"TAKO" is produced under complete laboratory control. Large tonnage used by the insecticide-pesticide, fertilizer, chemical, & other large industries.

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Standard's convenient NH_3 and Nitrogen Solutions plant location makes it possible for the Standard salesman to offer fast delivery. Accessibility of the plant to truck routes, plus fast loading and turn around, makes Standard a handy, ready source of supply for these products. Let our salesman tell you more. Or write Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.

You expect more from STANDARD and get it!

Hoffman Joins IMC

The International Minerals & Chemical Corp., Chicago, has appointed Harold W. Hoffman as an agricultural sales representative in its Potash Division's district sales office in Shreveport, La.

Mr. Hoffman is responsible for agricultural potash sales in Louisiana, Texas, and Southern Mississippi. He formerly was with the Virginia-Carolina Chemical Corp. in Shreveport.

R&H Triazine Now Available

The Rohm & Haas Co., Philadelphia, has announced that its triazine benzoguanamine, is available in commercial quantities. E. H. Riddle is handling sales of the product for the company's Special Products Department.

Benzoguanamine is reported to have possibilities as an intermediate for chemicals for application in a number of fields including pesticides, pharmaceuticals and dyestuffs. Currently it is of principal interest as a raw material for resins by reaction with formaldehyde.

Pyrethrum Growers Appoint

African Pyrethrum growers have appointed Biddle Sawyer & Co., Ltd., London, as agents for the United Kingdom and Ireland of the Pyrethrum Boards of Kenya, Tanganyika, and the Belgian Congo.

At the same time, a European technical headquarters, named African Pyrethrum Technical Information Centre, Ltd., was established in England. Dr. T. F. West is in charge of the center.

Spencer Names Two

The Spencer Chemical Co., Kansas City, Mo., has named Dr. Nat C. Robertson and Dr. O. V. Luke to top positions in the company's research and development division. Dr. Robertson was elected vice president in charge of research and development and Dr. Luke is director of central research.

Before joining Spencer, Dr. Robertson was a vice president and director of research for the Escambia Chemical Corp. Dr. Luke formerly was manager of plastics research for the Celanese Corporation of America.

Named Factory Agents

The Poulsen Co., Los Angeles, has been appointed direct factory agents for the W. J. Fitzpatrick Co., Chicago, designers, developers, and exclusive manufacturers of FitzMill industrial processing machinery.

The Poulsen Co. for more than 21 years has designed and manufactured specialized material processing and handling equipment for the food, chemical, fertilizer, and other industries.

California Fertilizer Firm

The Farmers Agricultural Chemical Co. has started operations in Chico, Calif., dealing in fertilizers. Directors are J. L. Rawlins, 814 Toyon Way, O. A. Kilpatric, 315 W. Legion Ave., and J. D. Peters, Jr., 117 W. Lincoln Ave., Chico.

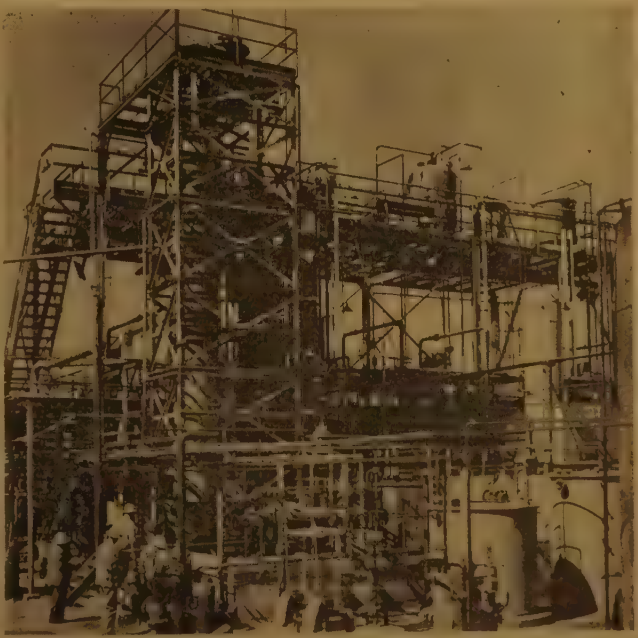
Joins Retzloff Chemical Co.

R. L. Holtzendorf has joined the staff of Retzloff Chemical Co., Alameda, Texas. He will do sales technical service and new product development work for the company.

He formerly was with the Monsanto Chemical Co. Retzloff manufactures emulsifiers used in formulating agricultural chemicals.

Trithion Plant Completed

The first commercial plant to produce Trithion, an insecticide-miticide developed by the Stauffer Chemical Co., New York, has been completed at Henderson, Nevada. Trithion is a non-systematic residual compound which is effective against a wide range of insects. It can be formulated as a dust, wettable powder, flowable concentrate, or as an oil additive. An official tolerance for trithion has been established on apples, pears, crabapples, and quinces.



Cyanamid Names Patton

Omar L. Patton has been appointed assistant manager of sales training for the agricultural division of the American Cyanamid Co., New York.

Ask Review of FDA Proposal

The Naugatuck Chemical division, United States Rubber Co., New York, has asked the Food and Drug Administration to refer its new proposal establishing a zero tolerance for Aramite when used on food crops to an advisory committee of nationally-known scientists for decision.

The FDA published in the Federal Register last month a proposal that a zero residue tolerance for the chemical be established for fruit and vegetable crops. Aramite currently has a residue tolerance of one part per million for food crops. According to FDA officials, their reason for the new proposal is based on toxicity data which shows that Aramite, when fed in large amounts, caused tumors in rats and dogs.

Naugatuck Chemical said that studies carried out by the company over a period of eight years indicate that Aramite will not cause tumors in rats or dogs at the dosages now being used on food crops and that the type of hepatoma, or liver tumor, caused by Aramite in these animals is not equivalent to the liver tumor which is observed rarely in man.

AMMONIA

By the Push-button Process

Ammonia plant start-up operations are virtually a matter of "push-button" routine with Chemico; for Chemico has designed and constructed more than 50 ammonia plants in the last 40 years.

While new-comers to the field are constantly running into costly difficulties and delays with unreliable and even untried processes, Chemico designed plants are profitably producing an estimated 25% of the world's synthetic ammonia. Investors in the chemical industries may be interested to learn that despite the proven performance and countless advantages of Chemico's ammonia processes, it frequently costs less to build a Chemico Plant.

Write today for Chemico Bulletin #357 which lists the alternate feed stocks and methods for gas purification and production in the making of ammonia.

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TVA Holds Open House for Fertilizer Producers

Charles H. Young, TVA Manager of Chemical Engineering, on May 28th invited small fertilizer producers to familiarize themselves with the technical developments available to them at the TVA Fertilizer-Munitions Development Center, Muscle Shoals, Alabama, for use or adaptation to their operations.

"Twenty-five years of TVA fertilizer research and plant operation have produced a large store of technical information and experience of great help to manufacturers," Mr. Young said. "To an increasing extent, the fertilizer technology developed here is becoming applicable in the small fertilizer plant. We want to be sure that no small company fails to make use of the assistance available simply because it does not know about it, is apprehensive of the cost, or has the mistaken impression that TVA developments are useful only to large companies."

Mr. Young pointed out that the research and development facilities at the Muscle Shoals Center are open to industry representatives, research and operating personnel are available for consultation, patented developments are licensed for industrial use, all without royalty or other charge. He described the following processes and equipment which are being widely used or can be more widely used by small fertilizer producers:

Ammoniation and Granulation

The art of ammoniating and granulating fertilizers is of primary importance to the entire fertilizer industry. TVA has been studying this art for some five or six years and has turned out a number of very useful advances. The TVA ammoniator-granulator — essentially a rotating drum—is now used in well over a hundred plants, large and small. Fifteen equipment manufacturers have built and installed the unit in plants throughout the country. It can be used to make high-analysis granular products with various commonly available materials such as ammonia, nitrogen solutions, solid nitrogen materials, superphosphates, diammonium phosphate, sulfuric or phosphoric acids, potash, etc.

A high degree of ammonation can be reached in the equipment to make best use of low-cost nitrogen materials. Requirements and techniques have been developed by the TVA investigators for numerous formulations, including 12-12-12, 10-20-20, 5-20-20, 0-20-20 20-10-10, and others. High-analysis fertilizers such as 17-17-17 and 16-48-0 can be made in the ammoniator with nitrogen solutions, phosphoric acid, and potash.

Granular superphosphate can be made in the unit. Both the mixing of rock and acid and the granulation are done in the rotating drum which, in

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Successful growers prefer fertilizer and fungicide formulations containing Triangle Brand Copper Sulfate. They know that in fertilizers it is necessary for enrichment of the soil; in fungicidal sprays, where Bordeaux Mixture is the most reliable, or in copper dusts, Triangle Brand Copper Sulfate has definitely proved its superiority over organic materials.

Use of Triangle Brand Copper Sulfate in sprays, dusts and fertilizers results in larger and healthier crops, meaning MORE PROFIT for the grower and MORE PROFIT for the mixer or formulator who serves him.

Triangle Brand Copper Sulfate, which will increase your profits, comes in these convenient forms:

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DIAMOND (snow) small or large crystals, containing 25.2% metallic copper.
BASIC Copper Sulfate in powder form, containing 53% metallic copper.

Contact us today for further information on Triangle Brand Copper Sulfate and its use in agricultural formulations.

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this case, acts as an acidulating and granulating unit rather than an ammoniating and granulating unit. Thus, it is possible to use this single piece of equipment for making either superphosphate or mixed fertilizers.

Superphosphates

TVA's continuous superphosphate mixer, a simple cone, is being used in many small plants. A few years ago only triple superphosphate was made in the cone. Now it is a production unit in many ordinary superphosphate plants. Equipment manufacturers have designed efficient low-cost plants around the cone mixer, and superphosphate of excellent quality is made in the units.

A TVA process that may prove to be particularly useful to the industry is one in which superphosphate is produced for immediate ammoniation. By using finer rock and an excess of acid more dilute than is the usual practice, the TVA investigators found that superphosphate, either ordinary or triple, could be produced ready for ammoniation in just one hour. This process makes possible the immediate production of mixed fertilizers and eliminates the need for a large inventory of superphosphate.

Considerable study has been given the use of concentrated materials such as diammonium phosphate, urea, calcium metaphosphate, granular potash, and others, in the production of high-analysis fertilizers. Numerous formulations have been made as dry mixtures and as granular products. They have been studied to determine chemical compatibility, segregation characteristics, and storing and drilling qualities. Some of the grades made in these experiments are 18-18-18, 16-32-16, 11-28-28, and 26-26-0. The data from these tests are of particular interest to dry mixers and bulk blenders.

Liquid Fertilizers

Two big problems in improving liquid fertilizers are to make more concentrated liquids and to use cheaper materials. The newly developed superphosphoric acid, now being produced experimentally and distributed by TVA for testing, is a big help in making better liquid fertilizers.

The acid is over 40 per cent more concentrated than the usual commercial phosphoric acid and can be used to make mixed liquid fertilizers containing 40 or 50 per cent more plant food. Increasing concentration of liquids saves on storage and handling for producer and farmer.

Technical help on these and other developments is freely available to fertilizer producers, This applies especially to the small companies that have few or no technically trained employees.

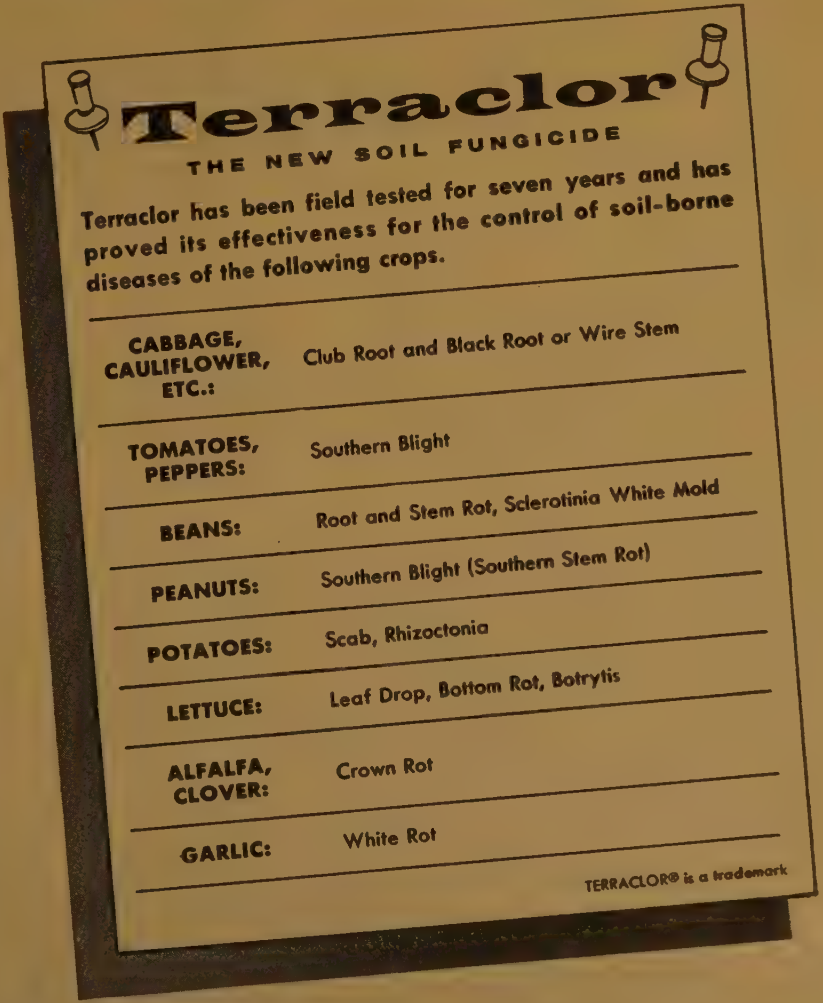
•

Washington Control Program

A control program for insects and other pests of truck crops has been published for commercial growers in the state of Washington by the Agricultural Extension service of the state college at Pullman, Wash.

The 16-page folder lists control measures for general feeders that attack most truck crops.

FORMULATORS:
profit from this new market–



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POTATOES:	Scab, Rhizoctonia
LETTUCE:	Leaf Drop, Bottom Rot, Botrytis
ALFALFA, CLOVER:	Crown Rot
GARLIC:	White Rot

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NPFI Southwest Group Meets

Members of the National Plant Food Institute's Southwest Industry Advisory Committee held their first meeting in Shreveport, La., May 8 to outline and discuss the Institute's Southwestern research and education program.

Dr. Russell Coleman, executive vice president, and Dr. Robert L. Beacher, Southwest regional director, represented the Institute at the session. S. M. Hackett, president of the Dixie Fertilizer Co., Inc., is chairman of the committee. Others on the committee include: L. G. Black, Ark-Mo Plant Food Co.; J. C. Chambers, Campbell Fertilizer Co.; J. W. Ground, III, Davison Chemical Co.; L. L. Jaquier, Phillips Petroleum Co.; S. L. Nevins, Olin Mathieson Chemical Corp.; S. B. Tatem, Swift & Co.; Dr. John R. Taylor, Grand River Chemical Division of Deere & Co.; and Tom Wright, Texas Farm Products Co.

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PYRAX ABB
The most widely used pyrophyllite in agriculture. Adheres electrostatically to dry foliage. Ideal for aircraft dusting.

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Outstanding dispersing agents. Produce increased toxicant effectiveness through better dispersion of wettable concentrates.

CONTINENTAL CLAY
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Rocky Mountain Conference

The 29th annual meeting of the Rocky Mountain Conference of Entomologists will be held at the Cameron Pass 4-H Club Camp near Gould, Colo., August 10 to 14.

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Features Best Fertilizers Co.

Tideways, a magazine published by the Port of Stockton, California, contains a feature article on the Best Fertilizers Co. of Lathrop, Calif., in its March issue. The article reviews the history of the Best Co., founded in 1932 by Lowell W. Berry, the present president of the firm, from its original plant in Oakland to the plant of the California Ammonia Co. now under construction at Lathrop. Best will manage this $6 million plant under a 10-year contract.

•

Italy Ups Pesticide Output

The Italian chemical industry is expected to place increasing importance on the production of pesticides and fertilizers in an effort to bring about higher farm production, according to a report on the industry in the *Journal of Commerce*.

Pesticide products currently made in Italy by various companies, including American interests, are formulations based on DDT, dichloroethane, hexachlorocyclohexane, lindane, chlordane, aldrin, parathion, and on tetraethylpyrophosphate. Production capacity for DDT in Italy is said to be about 100 tons per month. Inorganic fungicides based on copper, mercury, and sulfur also are produced in Italy.

Both the Edison and Montecatini Chemical Companies have added to present facilities and have built new plants for production of nitrogen fertilizers. The main problem seems to be that much of Italy's farm population is forced to work on soil that is not very productive and, as a result, farmers have little money for chemicals and farm machinery. Chemical industry spokesmen, however, are reported in the *Journal of Commerce* as indicating that the situation could be helped by government aid, improved living standards, and benefits from the European common market.

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- **IT'S SIMPLE!** Just one scale system—*not two or three*—fewer moving parts, wearing points.
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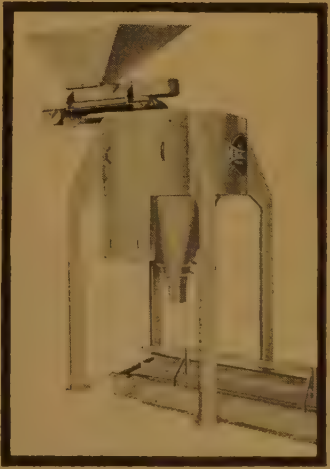
- **IT'S COMPLETELY ELECTRIC!** No troublesome air cylinders or hydraulic connections—needs no compressor.

The SOUTHLAND costs less, *saves more* . . . less spillage and dusting; minimum headroom and floor space; simple installation and maintenance. Enthusiastic users say it's "tops" in dependability.



All this, complete, less conveyor

only $2500

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Packaging Specialists for over 100 years

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525 International Trade Mart, New Orleans 12, La.

Please send me free complete information on the new SOUTHLAND PACKER.

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Company____________________

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City, Zone, State____________________

ACP Changes To Amchem

The American Chemical Paint Co., Ambler, Pa., has announced a change in its corporate name to Amchem Products, Inc.

Officials of the company stated that, since the company started 44 years ago, its activities have been expanded and its products diversified in the field of chemicals and it no longer manufactures paint of any kind.

•

Arnold Joins Sinclair

William J. Arnold has been appointed a sales representative for Sinclair Chemicals, Inc., a subsidiary of Sinclair Oil Corp. His headquarters are in New York.

Prior to joining Sinclair, Mr. Arnold was employed by Pfister Chemical Works and later by Sinclair and Valentine Co. His territory includes metropolitan New Jersey and New York and portions of Connecticut and Massachusetts.

•

See Profit Rise in '59

The Potash Co. of America, Carlsbad, N. Mex., expects that a switch in its production of potash to richer Canadian reserves from its present New Mexico operations next November should bring an earning improvement next year, according to the *Wall Street Journal*.

The company said that because of lower U.S. fertilizer use this year and a decline in exports, the company may report a net for the year ending June 30 about 10 to 15 per cent below fiscal 1957. When the company is in full production in Canada, it will be turning out about 600,000 tons of muriate of potash there yearly and about 200,000 tons from its facilities in Carlsbad.

•

NPFI College Grants

The National Plant Food Institute has announced a series of grants to colleges in various sections of the United States for the purpose of supporting research projects and fertilizer demonstration programs.

Plans have been completed with North Carolina State College, Raleigh, for a state-wide series of taped radio broadcasts on subjects dealing with soil fertility, soil tests, fertilizer placement, liming, and related material. The Institute will support a fertilizer demonstration program by the University of Wisconsin this summer and has made financial grants to six states to support research projects in developing new information on profitable response to fertilizer use in the Midwest. In addition, the Midwest office of the NPFI is planning to distribute Crop Production Potential wall charts for Illinois and Wisconsin to member companies.

Named Research Manager

Everett E. Klicker has been named market research manager for the Michigan Chemical Corp., Saint Louis, Mich. He will assist H. Stanley Lawton, vice president of sales and development.

Mr. Klicker formerly was sales and development manager of the Rare Earths and Thorium Division of Michigan Chemical. He had been employed by the International Minerals & Chemical Corp., Chicago, as product manager.

AGREM
EMULSIFIERS
for insecticides & herbicides

All purpose single emulsifiers: AGREM 500, AGREM 600. Either of these emulsifiers can be used to give flash dispersion and excellent stability to formulations containing chlorinated hydrocarbon toxicants in a wide variety of solvents.

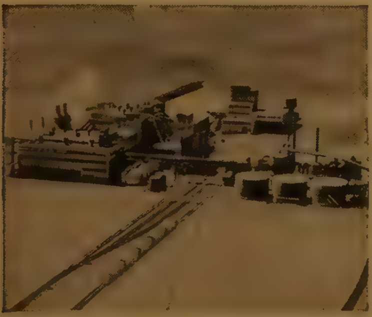
Specific phosphate insecticide emulsifiers: AGREM MP and M, AGREM P, AGREM Q. These emulsifiers are specifically suited to the formulation of Malathion, Parathion and Methyl Parathion.

All purpose twin emulsifiers: AGREM 102 and AGREM 103, AGREM 217 and AGREM 221. These emulsifiers, when blended properly, can be used to produce excellent concentrates containing the chlorinated pesticides and all herbicide esters.

Write today for data, samples and prices!

THEODORE RIEDEBURG ASSOCIATES
415 Lexington Ave. New York 17, N. Y.
MUrray Hill 7-1488

Big Dave announces...
A new triple super for ammoniation and granulation from Davison!



Never a delivery worry!

We've expanded our plant facilities to whittle down delivery schedules . . . to ship Run-of-Pile Triple Super *when, where* and the *way* you want it. Try us. We deliver the goods!

Davison's new Run-of-Pile Triple Superphosphate is guaranteed to satisfy you on every count!

- BETTER AMMONIATION RESULTS—Because of its friable texture, this triple super has a high rate of ammoniation . . . absorbs more pounds of free ammonia per unit of P_2O_5.
- HIGH IN P_2O_5 CONTENT—Constant high analysis . . . 46-48% A.P.A.
- STORES BETTER—This triple super is shipped in excellent mechanical condition. It is well cured, and milled and screened at time of shipment.
- UNEXCELLED QUALITY—This triple super is backed by Davison's more than a century of experience in fertilizer formulation. It's guaranteed to satisfy you on every count.
- IN STOCK AND READY TO GO—We're ready to ship Davison Run-of-Pile Triple Superphosphate by rail, ship or barge. Write or call today!

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CHEMICAL COMPANY
Division of W. R. Grace & Co.
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Chemical Process Equipment
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If you are planning a new plant, modernizing and expanding existing production facilities for maximum efficiency, or converting to latest production methods, you will profit by consulting Davidson-Kennedy Associates. From the drawing board to operating plant, Davidson-Kennedy Associates experienced specialists will handle all details of design, engineering, procurement and construction of your new facilities.

We welcome the opportunity to advise on your immediate problems.

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ATLANTA • CHICAGO

P. O. Box 189, Chicago Heights, Illinois

Co-Ral Registered For Cattle Grub

THE U. S. Department of Agriculture recently registered Chemagro's new insecticide, "Co-Ral", for the control of cattle grubs, screw worms, hornflies, lice, and ticks on livestock.

Co-Ral has undergone extensive testing by the USDA Agricultural Research Service and many state, university, and private research organizations for the past five years and is said to have demonstrated an exceptional ability to control cattle insects.

A 25 per cent wettable powder, Co-Ral is mixed with water and applied with conventional pressure spray equipment. In the control of cattle grubs, only one treatment per year is required if it is applied soon after heel fly activity terminates. Co-Ral kills the grubs before they are able to damage the meat or hide.

A grub control experiment carried out on a ranch in Nebraska with approximately 600 head of cattle was cited by Chemagro as being typical of tests conducted with Co-Ral during the past five years. A spot check of 102 head showed 98 of the cattle completely free of grubs. Six grubs were found on the remaining four animals. Test cattle were infested by 20 to 30 grubs each on the same date.

In tests for the control of screw-worm on sheep, Co-Ral protected sprayed animals from infestation for 10 to 20 days — long enough for most injuries to heal.

Co-Ral was developed by Farbenfabriken Bayer A.G., Leverkusen, West Germany, and formerly was known as "Bayer 21/199." It has not been registered yet for treatment of dairy animals.

Co-Ral will be available to livestock men within a few weeks through agricultural chemical dealers.

•

Esso Fungicide For Banana Disease

A low-volume oil spray that effectively controls a destructive, 55-year-old banana plant fungus in the tropics was introduced last month.

The fungicide, and the technique of applying it, were developed in a joint research program by the Esso Research and Engineering Co. and Esso Standard Oil, S. A. Both are affiliates of Standard Oil Co. (New Jersey).

The fungus (*cercospora musae*) causes banana leaf spot disease, called Sigatoka, which attacks the leaves of plants. In extensive field tests conducted on the island of Jamaica, Esso's new oil fungicide reduced the infection rate from 83 per cent to less than 5 per cent after two and a half months of bi-weekly spraying.

The Esso-developed oil spray is applied to banana plants as a fine mist, with less than two gallons an acre needed to effectively control the leaf spot blight. Helicopters can spray 50 acres an hour and fixed-wing planes 80 acres an hour with the new oil mist. A small farmer can use a simple portable knapsack-sprayer to cover an acre in ten or fifteen minutes.

The development of the fungicide was based on initial experiments with petroleum sprays undertaken in 1954 by Dr. Hubert Guyot and Dr. Jacques Cuielle, French government research scientists.

Fertilizer Round Table Calls For '58 Meeting Participants

THE 1958 meeting of the Fertilizer Industry Round Table, scheduled for Oct. 29 to 31 at the Sheraton Park Hotel, Washington, D. C., is being planned so that there will be maximum time for discussions in the meeting's question and answer forum.

A total of five sessions will be held starting the morning of the 29th and ending at noon on Friday, the 31st. As has been the practice in the past, no formal papers will be read by the speakers. The executive committee has proposed that the general theme for the 1958 meeting will be "Economics of Fertilizer Production." Questions and answers with ample discussion of such topics as the following are expected to be dominated by the general theme of cost, savings, and managerial skill.

On the question of the value of preventive maintenance over replacement of equipment, operating experience will be cited in support of specified practices in maintenance, inventory control, good housekeeping in general as sound economics, and proven safety practices.

The benefits of instrumentation will be discussed as they relate to temperature control in processing and the control of the flow of liquids and solids. The economics of processing will be studied with an emphasis on tons per man hour throughout and not on the dollars and cents involved. This is expected to permit any operator present to enter into the discussions.

Ammoniation, granulation, plant site selection, and use of raw material as factors influencing type of formulations are expected to provide for lively discussions. Questions will be presented on means for reducing or controlling gaseous effluent as related to formulating practices and operating techniques of drying, liquid distribution and mixing.

Drying, cooling, total power costs, and horsepower required to produce granulated fertilizer will be discussed with an emphasis on the relationship between the volumes of air required and the influences on fuel and electrical costs as related to tons handled.

The economics of selecting and using materials resistant to corrosion or causing tolerable corrosion is another possible topic that is suitable to the theme of the meeting.

The executive committee of the Round Table has called for participants who are willing to make short comments on the subjects based on actual experience. The committee also has called for questions, suggestions, and comments which deal with the subject matter. Interested persons have been asked to contact Dr. Vincent Sauchelli, c/o National Plant Food Institute, 1700 K. Street, N.W., Washington 6, D. C.

The executive committee also announced that the 1957 Proceedings of the Fertilizer Industry Round Table have been mailed out. Additional copies may be purchased at $2.50 each. Requests should be sent to H. L. Marshall, secretary-treasurer, 1604 Walterswood Road, Baltimore 12, Md.

DAVIDSON-
KENNEDY
COMPANY

Continuous Acidulation Plants

Now even small and medium sized fertilizer operators can afford a D-K superphosphate plant with a continuous den and TVA cone mixer. Operating costs are unusually low. Two men can operate the plant at the continuous rate of 20 tons per hour.

An actual sample taken recently from a new plant at Opelousas, La. shows this remarkably high analysis before curing:

MOISTURE 9.36%
T. P. A. 20.88%
INSOLUBLES 1.37%
A. P. A. 19.51%
FREE ACID 3.18%

For complete information call:

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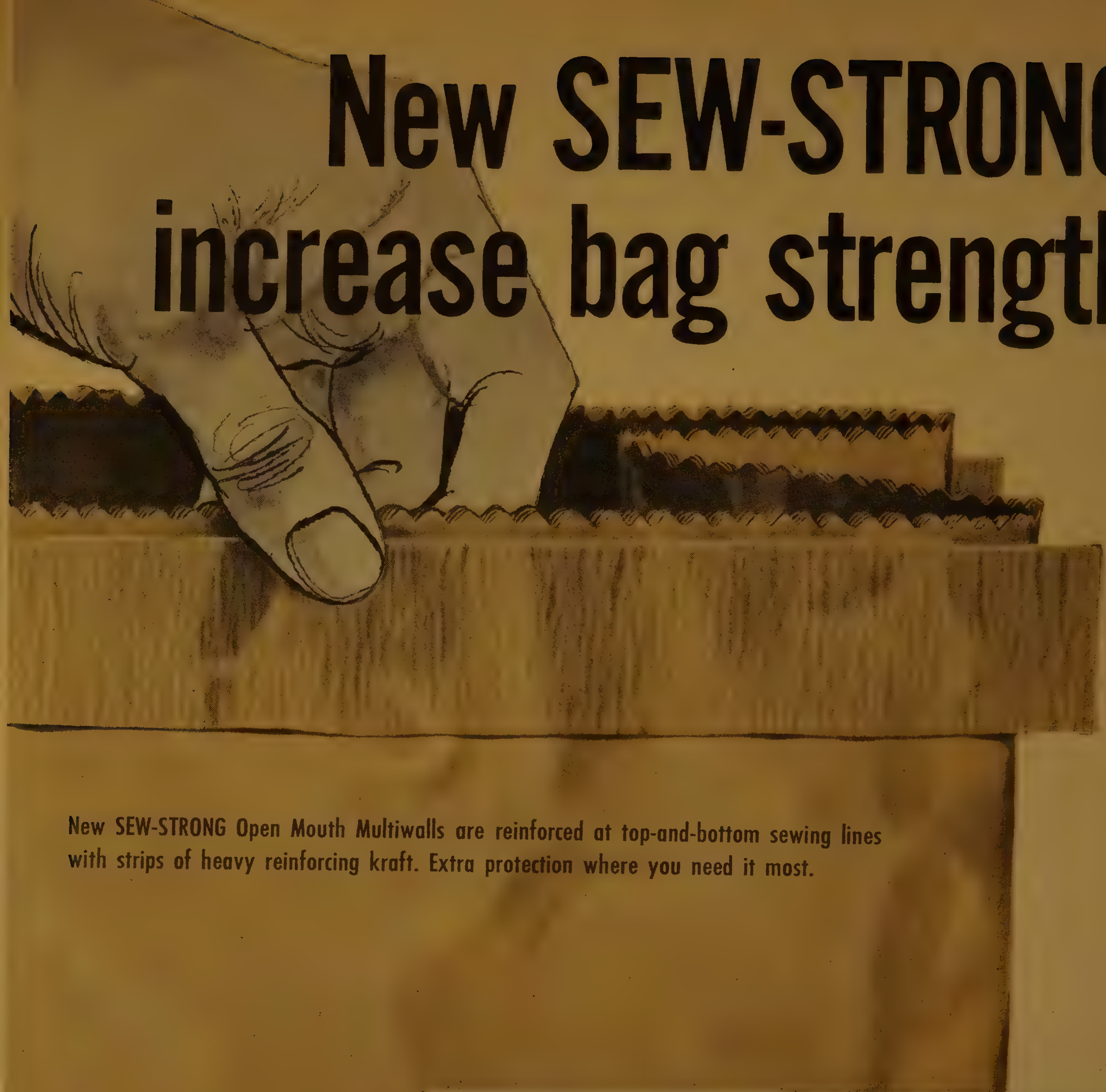
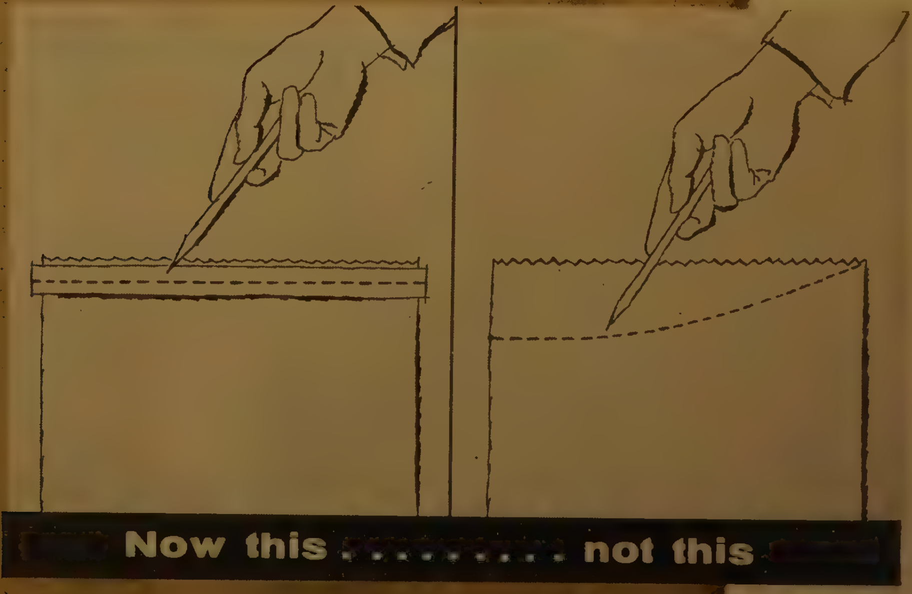
1090 Jefferson Street, N.W., Atlanta, Georgia

New SEW-STRONG increase bag strength



New SEW-STRONG Open Mouth Multiwalls are reinforced at top-and-bottom sewing lines with strips of heavy reinforcing kraft. Extra protection where you need it most.



Now this .... not this

open mouth Multiwalls ...help reduce costs!

Union's SEW-STRONG closure for Sewn Open Mouth Multiwalls now offers you the same money-saving advantages available in SEW-STRONG Sewn Valve Bags.

SEW-STRONG now has been perfected for Sewn Open Mouth Multiwalls. This unique closure method (heavy reinforcing tape strips at each side of the top-and-bottom sewing lines) is remarkably effective. It's simple and extremely low-cost, too, for the sewing reinforcement is added on the *outside* of the bag.

Stronger bags

Tests show that 95 per cent of all sewn Multiwall breakage—aside from tears, snags and scuffing—occurs at the sewing line. SEW-STRONG's special reinforced sewing line construction practically eliminates this breakage.

Lower costs

There's a good chance SEW-STRONG's added strength at the sewing lines can help reduce your costs by reducing basis weight—at no sacrifice in strength. Actual savings will, of course, depend on the present basis weight of your bags, your product, and how it is normally handled.

Up to 3″ shorter bags!

You can close SEW-STRONG Open Mouth bags right at your plant using any conventional overbound tape sewing head or the special, Union *Sew-Straight* sewing head attachment (only $60!). With this attachment you sew with an "E" head in a perfectly straight line 1″ below the top of the bag—and at *no reduction of filling speeds!* This straight line, controlled sewing enables you to use up to a 3″ shorter bag.

Uniform bag appearance

Union's SEW-STRONG construction for Open Mouth Multiwalls results in a top closure identical in appearance to the bottom closure .... a perfect pillow-shaped bag without long ears . . . a bag that handles better—warehouses better—merchandises better. When both Sewn Valve and Sewn Open Mouth Multiwalls are used, filled bags have similar appearance.

Write for samples of these new bags today.

For sample of new SEW-STRONG Open Mouth Multiwall

Union Bag-Camp Paper Corporation
Multiwall Division, 233 Broadway
New York 7, N. Y.

Please send free sample of the newly developed Union SEW-STRONG Open Mouth Multiwall.

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CITY ....................ZONE....STATE.......

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UNION MULTIWALLS

Union Bag-Camp Paper Corporation
233 Broadway, New York 7, N.Y.

HIGH-K

MURIATE OF POTASH

for the

PLANT FOOD INDUSTRY

THIS symbol stands for high-grade coarse and uniform Muriate of Potash (60% K_2O minimum). Southwest Potash Corporation provides a dependable supply of HIGH-K* Muriate for the plant food industry.

*Trade Mark

Southwest Potash Corporation

61 BROADWAY • NEW YORK 6, N. Y.

Trade Listing

National Agricultural Chemicals Association, Association Building, 1145 19th St., N.W., Washington, D. C. Lea Hitchner, executive secretary.

National Plant Food Institute, 1700 K St., N. W., Washington, D. C. Paul Truitt and Russell Coleman, executive vice-presidents.

Regional Offices listed on page 123.

Soil Science Society of America, 2702 Monroe St., Madison, Wisc. L. G. Monthey, executive secretary.

American Phytopathological Society, S. E. A. McCallan, secretary, Boyce Thompson Institute, Yonkers, N. Y.

American Chemical Society, 1155 16th St., N. W., Washington, D. C.

Association of Official Agricultural Chemists, P. O. Box 540, Benjamin Franklin Station, Washington, D. C., William Horwitz, secretary-treasurer.

Agricultural Ammonia Institute, Hotel Claridge, Room 305, Memphis, Tenn., Jack Criswell, executive vice president.

American Society of Agricultural Engineers, F. B. Lanham, secretary, 505 Pleasant St., St. Joseph, Mo.

Carolinas-Virginia Formulators Association, 516 S. Salisbury St., Raleigh, N. C. Hugh Horn, secretary-treasurer.

California Fertilizer Association, Sidney Bierly, executive secretary, Suite 1, Boothe Building, 475 Huntington Drive, San Marino, California.

Chemical Specialty Manufacturers' Association, 110 East 42nd St., New York City, Dr. H. W. Hamilton, secretary.

Entomological Society of America, 1530 P. Street N. W., Washington, D. C., R. H. Nelson, secretary.

Mid-West Soil Improvement Committee, 121 West Wacker Drive, Chicago 1, Ill. Z. H. Beers, executive-secretary.

National Nitrogen Solutions Association, 2217 Tribune Tower, Chicago, Ill. M. F. Collie, secretary.

National Cotton Council, PO Box 9905, Memphis, Tenn.

American Society of Agronomy, 2702 Monroe St., Madison Wisc. L. G. Monthey, executive secretary.

Weed Society of America, W. C. Shaw, secretary, Field Crops Research Branch, Beltsville, Md.

Western Agricultural Chemicals Association, Charles Barnard, executive secretary, 2466 Kenwood Ave., San Jose, Calif.

Chemagro Names Three

The Chemagro Corp., New York, has named Dr. James A. Costello supervisor of the process development group in the manufacturing department of the company's Kansas City plant.

In addition, Lawrence W. Berglund has been appointed supervisor of the engineering group and Robert A. Mohr has been named supervisor of the pilot plant at Kansas City. Dr. Costello formerly was process chemist for Chemagro. Mr. Berglund has been design engineer and Mr. Mohr was a process engineer prior to their recent appointments.

•

Mark 70th Year

D. B. Smith & Co., Utica, N. Y., producers of a complete line of hand, continuous, and compressed air sprayers and insecticide dusters, is celebrating its 70th year of operation.

•

National Animal Disease Lab

Official acceptance by the USDA General Services Administration of architectural and engineering plans and specifications for the new National Animal Disease Laboratory at Ames, Iowa, is expected shortly.

The laboratory will be a center for the study of livestock and poultry diseases. Funds totalling $16,250,000 for the establishment of this laboratory were included in an appropriation bill signed by Eisenhower in 1956.

•

Yale Names Western Agents

Coast Associates, Inc., Seattle, Wash., has been named sales and service representative for Yale industrial lift trucks in Western Washington and Alaska by the Yale Materials Handling Division, The Yale & Towne Manufacturing Co., Philadelphia. Stocks of new lift truck equipment and replacement parts are being supplied to the new representative from the Yale plant and parts depot at San Leandro, Calif.

•

Say Employee Revealed Secrets

Charles M. Miller, an engineer formerly employed at the Soda Springs, Idaho, plant of the Monsanto Chemical Co., was found to have unlawfully revealed Monsanto trade secrets by Judge A. Sherman Christenson of the U. S. District Court of Utah.

Monsanto filed the suit 17 months ago and asked for an injunction and damages against the defendants. Besides Mr. Miller, F. C. Iorkelson Co., a Utah firm of consulting and designing engineers, and Central Farmers Fertilizer Co., an Illinois corporation, were named defendants in the original suit. The court reserved decision in the matter of damages.

Store Adds Garden Supplies

The Kimbell Milling Co. has opened a new farm store at Big Spring, Texas, that is handling a full line of fertilizers, insecticides, and other agricultural chemicals. In addition, garden supplies and other products for the home and farm are being stocked.

Previously the company had handled feed and allied lines exclusively. This is its first venture into agricultural chemicals.

Barden Clay Quiz

DO YOUR DUSTS HAVE GROUND ROLL?

Ground or plane dusts made with Barden Clay develop a "ground roll" covering the *underside* as well as the upperside of the leaf. Use Barden's low bulk density to modify heavy and abrasive diluents for maximum quality and best performance at low cost. Barden is the industry's kaolin standard for a carrier-diluent in wettables and dusts; for an anti-caking conditioner in prilled fertilizers, and 93-94 percent sulfur.

These Barden features make it superior for all formulations: lowest abrasion...better sticking...high bulking value...greater uniformity...better deposits ...maximum economy...superior wettables.

Working samples on request.

J. M. HUBER CORPORATION
100 Park Ave., New York 17, N. Y.

Wise owls read Huber Technical Data. Ask to be put on our mailing list.

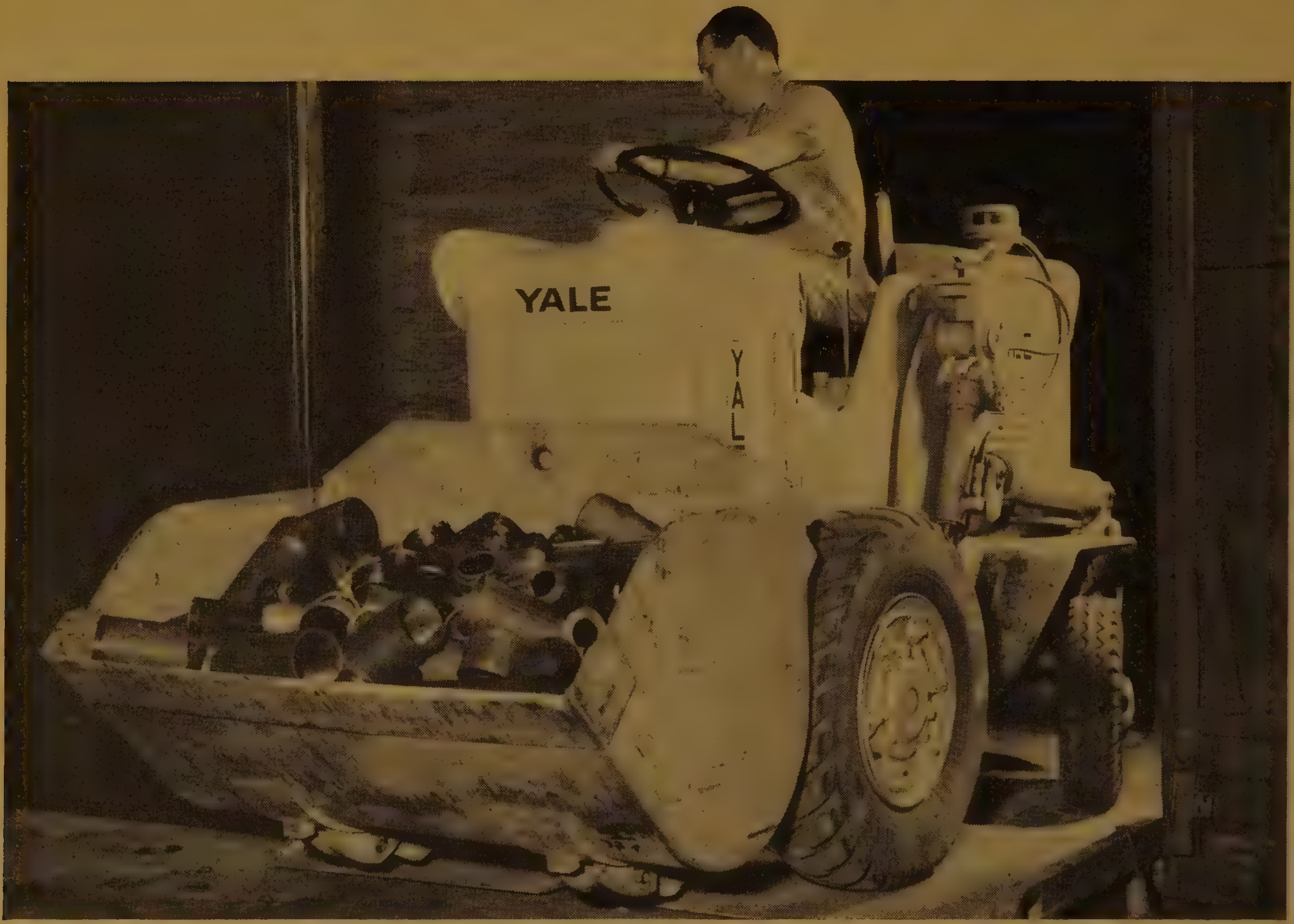
FOR DUST OR SPRAY
USE BARDEN CLAY

The Low-Cost Scientific Diluent

HUBER

Interested in 75% Wettables and Concentrates? Zeolex 7A is the new synthesized carrier for top results. It's versatile, too: serves as a bulking agent, and as a static-free conditioner for 99 percent sulfur grinding. Write for more information.

NEW YALE INDUSTRIAL TRACTOR SHOVEL



Carries more tonnage every hour

—field tests prove it!

Actual field tests prove the amazing work-capacity of the new Yale Industrial Tractor Shovel. Extra tonnage—extra work—extra duty cycles! Operating acceleration speed is 8 mph in 3.5 seconds. And Yale's exclusive fully automatic Torque Transmission produces quicker, smoother starting, more power under load conditions.

Loader-linkage advantages are unique. Exclusive 45° ground-level tipback provides top loading action, minimum spillage in grade-level position. Exclusive 6′ dumping clearance (highest on any model of similar wheelbase) automatically returns bucket from full dump position to dig position.

Let your operator work with it. He'll like the roomy, clear cockpit—the finger-tip controls—the ease of handling—the fact that there are no gears to shift. He'll especially like Yale's exclusive Safety-Curve Arms—that never rise above the side frame to cause injury. For a demonstration in your plant or further data write The Yale & Towne Manufacturing Co., Philadelphia, Pa., Dept. A-1066.

COMPARE THESE YALE FEATURES:

- Exclusive Yale Torque Transmission (fully automatic)
- Exclusive 45° ground-level bucket tipback
- Exclusive 6′ dumping clearance
- Exclusive Safety-Curve Arms
- Exclusive acceleration speed to 8 mph. in 3.5 sec.
- Exclusive sealed brakes
- Exclusive forward and rear operating lights
- 2500 lbs. carrying capacity
- Short wheelbase for minimum turning radius
- Gasoline or LP-Gas powered

YALE*
*REG. U. S. PAT. OFF

INDUSTRIAL LIFT TRUCKS & TRACTOR SHOVELS • HOISTS

YALE & TOWNE

GASOLINE, ELECTRIC, DIESEL & LP-GAS INDUSTRIAL LIFT TRUCKS • WORKSAVERS
WAREHOUSERS • HAND TRUCKS • INDUSTRIAL TRACTOR SHOVELS • HAND AND ELECTRIC HOISTS

YALE MATERIALS HANDLING DIVISION. THE YALE & TOWNE MANUFACTURING CO. MANUFACTURING PLANTS: PHILADELPHIA, PA.; SAN LEANDRO, CALIF.; FORREST CITY, ARK.

Clark Names Three Dealers

Three new dealers have been appointed in Tennessee to sell and service the line of fork trucks, straddle carriers, towing tractors, and powered hand trucks produced by the Industrial Truck Division of the Clark Equipment Co., Battle Creek, Michigan.

The new dealers are: Material Handling Equipment Co., Nashville; Valley Materials Handling, Inc., Knoxville; and Phelps Equipment Co., Chattanooga.

•

Australian Plant To Expand

The superphosphate works of Cuming, Smith & Mount Lyell Farmers Fertilizers Ltd., Albany, Western Australia, are being expanded by the addition of two acid chambers and a rock crushing mill.

Last year, eight bays were added to the superphosphate shed and a second dressing plant and grab crane were installed. The company expects farmers in Western Australia to bring added land into production during the 1959 growing season and, as a consequence, increase their fertilizer purchases. Given normal seasons and reasonable economic prices for farm produce, particularly wool, the demand for fertilizers in the Albany area is expected to reach 140,000 tons in the next five years.

•

Represents Texas Company

Robert E. Sattler, formerly teaching assistant in the Agronomy Department of the University of Illinois, has been appointed a sales representative of The Texas Company's Petrochemical Sales Division.

Mr. Sattler will call on fertilizer manufacturers, paper companies, and other users of ammonia and nitrogen solutions in Wisconsin and Minnesota. His headquarters, however, will be in Texaco's Regional Sales Office in the McCormick Building, Chicago.

•

Test Randox on Corn

A total of 2,500 midwestern growers have volunteered to devote at least one acre of corn or soybeans this year to demonstrate the effectiveness of Randox pre-emergence herbicide, according to the Monsanto Chemical Co., St. Louis.

The company said that the demonstrations were decided upon as the best possible means of letting growers see for themselves the results obtainable with Randox. Each of the cooperating growers has been sent a Randox "test-acre" kit which, in addition to the weed-killer, includes a Spray-Rater to insure the proper rate of application, detailed instructions for application and a printed form for an evaluation by the grower.

Colorado Garden Shops

Evergreen Gardens, Denver Colo., has opened ten garden and outdoor centers in Colorado and Wyoming this spring and expects to have two more operating later.

The company, which established its first store in March, now is the largest volume supplier of outdoor and garden supplies in the state. The garden centers feature a complete line of nursery stock, garden seeds and supplies, fertilizers, insecticides, patio supplies, and outdoor furniture.

SUMMIT **hydrous alumina silicates**

Now . . . for the first time . . . Summit offers quality, test-proven hydrous alumina silicates in not one, but *three* separate products, *each with its own controlled particle distribution* for specific insecticide applications. Whether your choice is Summit SER-X, SER-A-SIL, or MICROCITE, you are assured of a product that:

- is free flowing.
- is highly inert with a neutral pH.
- is non-hygroscopic.
- offers good wetting characteristics.
- has a flat particle shape.

Like to know more about these versatile materials? Write *today* for technical literature and samples.

SUMMIT MINING CORPORATION CARLISLE, PENNSYLVANIA

A big promise—the *multiwall of TOMORROW!* But rigorous tests, both in laboratory and actual use, show that Bemis Multiwalls made with the revolutionary new extensible kraft offer the biggest multiwall development in years.

Testing still goes on. We can document more and more of the qualities of Bemis extensible bags . . . and we are learning more about which industries they will serve beneficially.

(Normally, an announcement of this kind would be held up until all tests are completed, but this development is so important, and final reports are so near, that you should be alerted.)

We can say positively, though . . . *the adaptability of Bemis Extensible Multiwalls for the fertilizer industry has been definitely proved. They will give you superior service, probably at a cost no greater than your present bag cost, maybe at a saving.*

You will certainly want to get the *complete* story about Extensible Multiwalls from your Bemis Man. And you will want to order a trial quantity—possibly 5,000 bags as a starter—in an early shipment of Bemis Multiwalls. Supplies will be somewhat limited until full production of the new paper develops. Meanwhile, all Bemis customers will, of course, get an "even shake."

You will be well advised, though, to get acquainted with Bemis Extensible Multiwalls as soon as possible . . . to learn how they fit into *your* operation.

WHAT IS EXTENSIBLE KRAFT PAPER?

It is sturdy kraft that is given a special mechanical treatment, during manufacture, to provide special qualities that are particularly desirable in Multiwall bags. This paper is made by West Virginia Pulp and Paper Company under the trade name "Clupak." "Extensible" means that it has a definite, though almost imperceptible, "stretch" *in both directions*. The "stretch" provides the qualities that make for better multiwall bags. (Note—This is *not* a *creped* paper.)

WHAT ARE THESE SPECIAL QUALITIES?

1. Because of the "stretch," it is stronger . . . more resistant to shock and breakage. Consequently, a lighter construction will provide an equally strong bag. (Paper weight can, in some cases, be reduced 20% or more without reducing strength.)
2. Although perfectly smooth to the touch, it has a "soft hand" and is easier to hold and handle.
3. Easier on the workman's hands.
4. Better stacking and storage, without slipping.
5. It gives added resistance to scuffing and abrasion.

Bemis

BEMIS BRO. BAG CO.

General Offices—408 Pine St., St. Louis 2.
Sales Offices in Principal Cities

BREVITIES

PHILIP H. MCLAUGHLIN has been appointed manager of sales development for the Industrial Chemicals Division of the Stauffer Chemical Co., New York.

AC

THE MICHIGAN CHEMICAL CORP., Saint Louis, Mich., has announced net earnings of $119,098 for the first quarter of 1958, compared with $157,961 for the similar period in 1957. Sales, however, were $2,782,808 in the first quarter of 1958 against $2,015,497 in 1957.

AC

DR. MAX Y. SEATON, vice president of the Food Machinery and Chemical Corp., New York, has retired from active service with the firm. He will continue as a consultant.

AC

A WEST GERMAN FIRM, Badische Anilin und Soda Werke, is installing machinery and equipment at a newly-constructed fertilizer plant in Kutahya, Turkey, which is expected to be ready early in 1959.

AC

LYLE C. ABBOTT has been named vice president in charge of the agricultural division and a member of the board of Klau-Van Pietersom-Dunlap, Inc., a Milwaukee advertising agency.

AC

DR. H. M. BRIGGS, dean of the College of Agriculture and director of the Agricultural Experiment Station at the University of Wyoming, last month was named president of South Dakota State College.

AC

THE CONNECTICUT AGRICULTURAL EXPERIMENT STATION, New Haven, reports that almost 2800 persons have purchased copies of an experiment station bulletin on the biology and control of insect pests and plant diseases. The 200-page publication, "Plant Pest Handbook", has been available for about 16 months.

AC

THE BOSS FERTILIZER CO. is building a 150-ton capacity fertilizer plant at Moberly, Oklahoma.

THE ANNUAL CHASE Bag Company Safety Awards was made to its branch in Goshen, Indiana, last month. The plant, which employs over 300 persons, worked the entire year without a disabling industrial injury.

AC

JACK A. LOVE was named manager of Calspray's Orlando, Florida plant recently. The Orlando plant is one of four calspray production centers making the Ortho line of insecticides, fungicides, weed killers and fertilizers.

PIKES PEAK ABSORBENT CLAY

CARRIER COMPATIBILITY

Pikes Peak clay's exceptionally low moisture content and pH of 5 is your assurance of highest compatibility with malathion, methyl parathion, ethyl parathion or other phosphated insecticides.

Don't take chances with the stability of your finished product or concentrate. Use Pikes Peak clay. It is ideal for adjusting bulk densities in finished products and as a carrier for either phosphate or hydrocarbon concentrates. Pikes Peak clay also safeguards the free flowing characteristics of your product.

When you buy Pikes Peak clay you buy uniformity you can count on. It is ground to a fineness of 95% through 325 mesh. Of course, other sizes are available to meet your requirements.

Find out about Pikes Peak clay today. See what its unrivalled compatibility factor can mean to you in product quality. Write now for more information and prices.

GRC GENERAL REDUCTION COMPANY
1820 ROSCOE STREET • CHICAGO 13, ILLINOIS

New
500 TPD
Concentrated
Fertilizer Plant
Now On Stream

for Scottish Agricultural Industries Ltd. . . .

Granulation section designed by Dorr-Oliver Incorporated

On March 17, 1958, Scottish Agricultural Industries Ltd. inaugurated their new 8.5 million dollar plant at Leith, Scotland, for producing ammonium phosphate based complete granular fertilizers. The new Leith plant includes three main process units—sulfuric acid production, phosphoric acid production and a fertilizer production section. The fertilizer section, designed by Dorr-Oliver Incorporated, utilizes the world-wide accepted Dorrco Granular Fertilizer Process.

Dorr-Oliver Project Sales Division, with over 41 years' experience in the field of concentrated fertilizer production via the wet process of manufacturing phosphoric acid, is staffed by engineers qualified to handle all phases of fertilizer plant design — from benefication of phosphate rock through laboratory studies and economic evaluation, to supplying a complete plant regardless of size.

DORRCO

DORR-OLIVER
INCORPORATED
WORLD-WIDE RESEARCH • ENGINEERING • EQUIPMENT
STAMFORD • CONNECTICUT • U. S. A.

Aerial view of S.A.I.'s newly completed concentrated fertilizer plant. Dorr-Oliver designed Granulation Section is located in building in front of stack at extreme right.

Named To Terra-Lite Sales

J. Wayne Phillips has been named sales representative for the Zonolite Co., Chicago., and will cover Ohio, Western Pennsylvania, and West Virginia for the firm's Terra-Lite Division.

Mr. Phillips will serve golf courses, fertilizer and agricultural chemical companies, and garden supply outlets.

•

Costa Rica Revises Labeling

Costa Rica has revised its regulations for the labeling of fertilizers placed on sale in that country. The new labels must show the name of the manufacturer, the name or trademark of the product, the number registered with the Costa Rican Directorate General of Agriculture and Livestock, and the chemical analysis.

•

Griggs Joins Ferguson

Roger Griggs has joined Ferguson Fumigants, Inc., Ferguson, Mo., where he will be engaged in technical service work. He will work towards developing new application methods for Ferguson's line of Dawson low dosage fumigants for grain and cereal mill application. He formerly was in charge of sanitation for the Pabst Brewing Co. plants in Peoria, Ill.

•

Bowen Technical Seminar

Bowen Engineering, Inc., New York, recently held a three-day technical seminar for the personnel of Bowen's newest manufacturers' representatives. The new representatives are: The R. F. Kleinfeldt Co., with offices in Pittsburgh and Cincinnati; Bruce A. Wilson & Co., Houston; and Robert A. Griffiths & Co., Rochester.

•

O.K. Sevin For Pears, Beans

Experimental labels covering the use of Sevin insecticide for control of insects attacking pears, beans, and grapes have been accepted by the United States Department of Agriculture, according to the Crag Agricultural Chemicals Department, Union Carbide Chemicals Co., Division of Union Carbide Corp., New York.

The Food and Drug Administration has established a temporary tolerance of 10 ppm for the new insecticide which now can be sold in limited quantities for field testing.

•

Cyanamid Cuts Output

The American Cyanamid Co., New York, has ordered a cutback of 40 per cent in production at its phosphate plant in Brewster, Fla. A higher inventory level than normal was given as the reason for the temporary cutback which means laying off 40 men for five months.

Escambia Names Clopton

John B. Clopton has been named director of sales of Escambia Chemical Corp., New York.

Mr. Clopton, who has been in the sales organization since early last year, will direct sales of the company's products, including ammonia, nitric acid, ammonium nitrate, nitrogen solutions, methanol, and polyvinyl chloride resins, produced at its three plants near Pensacola, Fla. His offices are in New York.

GLENDON — at Glendon, N. C.

Offering:

INSECTICIDE GRADE PYROPHYLLITE

- ph 6 to 7
- 30 lbs. per cu. ft.
- avg. particle size below 5 microns
- non-alkaline
- chemically inert
- 92-95% passes a 325 mesh screen
- non-hygroscopic

Insecticide Grade Pyrophyllite is the ideal diluent and conditioner for all types of insecticidal dusts. As it is non-hygroscopic, dusts compounded with Insecticide Grade Pyrophyllite will not absorb moisture. Nor is there any tendency even during extended storage, for the carrier to separate from the active ingredients.

Insecticide Grade Pyrophyllite has superior adhering properties, and because it is difficult to wet, it holds well on the plant leaves even during rain. When used as a carrier for products to be dusted by airplane, it settles rapidly minimizing drift, waste of materials, etc.

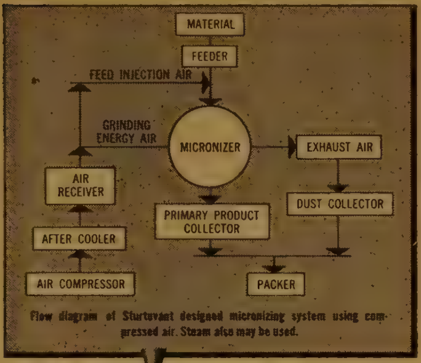
GLENDON PYROPHYLLITE COMPANY

P.O. Box 2414
Greensboro, N. C.

Plant and Mines
Glendon, N. C.

Need ½ to 44 Microns?

Sturtevant Micronizers* Make 325 Mesh Obsolete



Flow diagram of Sturtevant designed micronizing system using compressed air. Steam also may be used.

Production Model (15 in. chamber)

One Operation Reduces, Classifies

Sturtevant Micronizers grind and classify in one operation in a single chamber—provide fines in range from ½ to 44 microns to meet today's increased product fineness needs. Can handle heat-sensitive materials.

No Attritional Heat

Particles in high speed rotation, propelled by compressed air entering shallow chamber at angles to periphery, grind each other by violent impact. Design gives instant accessibility, easy cleaning. No moving parts.

Classifying is Simultaneous

Centrifugal force keeps oversize material in grinding zone, cyclone action in central section of chamber classifies and collects fines for bagging. Rate of feed and pressure control particle size.

Eight Models Available

Grinding chambers range from 2 in. diameter laboratory size (½ to 1 lb. per hr. capacity) to large 36 in. diameter production size (500 to 4000 lbs. per hr. capacity). For full description, request Bulletin No. 091.

Engineered for Special Needs

A 30 in. Sturtevant Micronizer is reducing titanium dioxide to under 1 micron at feed rate of 2250 lbs. per hr. For another firm, a 24 in. model grinds 50% DDT to 3.5 average microns at a solid feed rate of 1200-1400 lbs. per hr. A pharmaceutical house uses an 8 in. model to produce procaine-penicillin fines in the 5 to 20 micron range. Iron oxide pigment is being reduced by a 30 in. Micronizer to 2 to 3 average microns.

Sturtevant will help you plan a Fluid-Jet system for your ultra-fine grinding and classifying requirements. Write today.

Can Test or Contract Micronizing Help You?

Test micronizing of your own material, or production micronizing on contract basis, are part of Sturtevant service. See for yourself the improvement ultra-fine grinding can contribute to your product. Write for full details. STURTEVANT MILL CO., 123 Clayton St., Boston, Mass.

*REGISTERED TRADEMARK OF STURTEVANT MILL CO.

Equipment, Supplies, Bulletins

Two New Vulcan Drum Sizes

Vulcan Containers Inc., Bellwood, Ill., has expanded its production to include new open head grease drums and 15 gallon open and tight head drums with the new universal diameter of 13 15/16 inches as a production standard.

The new standardized line of drums, which comply with federal, military, and Interstate Commerce Commission specifications, is expected to streamline and simplify warehousing and distribution operations of such basic users of steel packaging as the chemical, adhesives, industrial maintenance supplies, and petroleum products industries.

•

New Richardson Scale Unit

The Richardson Scale Co., Clifton, N. J., has developed a new trigger arrangement with completely automatic cut-off that is said to permit faster bagging with a semi-automatic gross bagger.

The new arrangement holds the gate open longer and on most free flowing materials the trigger can be set for the exact weight desired, eliminating all trimming.

•

Organic Chlorines Booklet

Eleven organic chlorine compounds available in commercial quantities are described in a new 45-page booklet just published by Union Carbide Chemicals Co., Division of Union Carbide, New York. The booklet details physical and physiological properties, use information, shipping regulations, handling and storage, and specifications and test methods for the compounds described.

The booklet, entitled "Organic Chlorine Compounds," discusses applications for the compounds as fumigants, solvents and extractants, degreasing agents, dewaxing compounds, dry cleaning fluids, and intermediates in the manufacture of other chemicals. The materials discussed are ethylene dichloride, Chlorasol fumigant and solvent, propylene dichloride, trichlorethane, butyl chloride, 2-ethylhexyl chloride, dichlorethyl ether, dichlorisopropyl ether, triglycol dichloride, ethylene chlorhydrin, and epichlorhydrin.

Copies of the booklet are available from Union Carbide Chemicals Company, 30 East 42nd Street, New York 17, N. Y.

•

Yale Bin Dumping Attachments

A rugged, 8000 pound capacity, rotating bin dumping attachment for Yale industrial lift trucks has been developed by Yale Materials Handling Division, the Yale & Towne Manufacturing Co., Philadelphia.

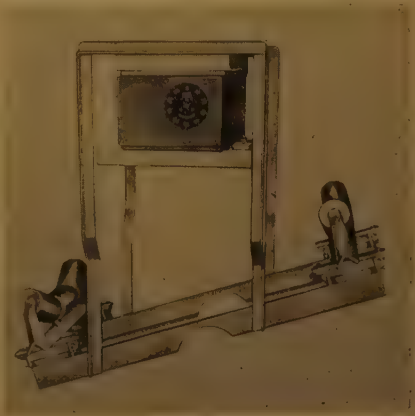
The attachment can handle bins ranging from 30 to 34 inches in height and up to 48 inches long.

•

Inventory Belt Scale

A new totalizing inventory belt scale that recalibrates linearly has been developed by the Thayer Scale Corp., Pembroke, Mass. The scales are available with capacities of 100 pounds to 300 tons per hour.

The scale and rollers support level or inclined conveyor systems and the endless belt is not altered or interrupted. The totalizer can be remotely located or can be read directly at the scale.



DID YOU GIVE AWAY PART OF YOUR PROFIT THIS SEASON?

You can find out right now! Check these questions–

- *Were the basis weights and sizes of your multiwall bags trimmed down to the actual needs of your product?*
- *Did your equipment provide weight accuracy as well as speed . . . or did it give away some of your product?*
- *Was the material settled, reducing bag size . . . another way to save on bag costs?*
- *Are you using the most efficient packaging equipment . . . valve? . . . O.M.?*
- *Are you using the bag type that assures you the lowest cost per ton?*

Questions like these–the kind St. Regis sales representatives ask when they analyze your packaging operation–help *save* your profits! St. Regis helps *build* your profits by designing multiwall bags for effective display at your point of sale. Top-quality printing and brand registration guaranteed! Call your St. Regis representative today . . . see how he can brighten *your* profit picture!

Multiwall Packaging Division
St. Regis
PAPER COMPANY
150 EAST 42ND STREET, NEW YORK 17, N. Y.

Squibb Ammonia Equipment

Squibb-Taylor Inc., Dallas, Texas, has published a booklet illustrating the Squibb lines of anhydrous ammonia equipment that includes Pitzer valves and controls, Taylor liquid level gauges, and Coast Copon tank finishes.

•

Loading Assemblies Catalog

The Jordan Industrial Sales Division of OPW Corp., Cincinnati, offers a catalog describing Jordan's loading assemblies and accessory products such as the tank car loading and unloading assembly and the pressure loading valves.

The illustrated, 24-page catalog contains detailed product descriptions and photos together with dimensional drawings, installation layouts, and selection instructions.

•

Waste Problems Booklet

A booklet has been prepared describing the services available from Roy F. Weston, Inc., Newton Square, Pa., a consulting firm specializing in water supply, industrial water pollution control, sewage treatment, and air pollution control. The booklet also includes a list of industries served and details of the qualifications of staff members of Roy F. Weston, Inc.

•

TVA Fertilizer Map

The Tennessee Valley Authority, Knoxville, Tenn., has issued a map showing the location of 140 industrial plants licensed to use TVA developed processes or equipment.

The map is keyed to show location of plants using the continuous ammoniator, the superphosphate mixer, a liquid fertilizer process, phosphoric acid processes, and other processes or equipment. The most widely applied development, as shown by its use in over a hundred plants, is the TVA-type ammoniator granulator.

•

Carbola Rentable Sprayer

The Carbola Chemical Co., Natural Bridge, N. Y., has announced that their new power sprayer is now being offered for farmer rental through many local dealers. Most Carbola dealers are expected to make this sprayer available at a daily rental fee of $3.50 per day.

The model #500 Electric Power Sprayer has a $\frac{1}{3}$ h.p. motor, is self-agitating and has a 12 gal. capacity. It will discharge up to one gallon per minute at pressures up to 150 lbs. The gun is adjustable to produce a fine mist spray for broad coverage or a long stream to reach high places. The weight of this Sprayer is only 126 pounds.

•

New Swivel Connectors

The Spraying Systems Co., Bellwood, Ill., has introduced a new line of lightweight, double and single swivel connectors for mounting to drop pipe ends. The connectors are used for setting spray nozzles to any desired angle in row crop spraying.

Connector bodies easily are adjusted to any point in a complete 360 degree range and are held in position by lock nuts. They are made of both brass and aluminum.

•

Automatic Bag Release

The Richardson Scale Co., Clifton, N. J., is offering a new automatic bag release mechanism that converts G-73 Impackers to automatic operation and increases the bagging speeds.

The unit is air-operated and may be supplied as an optional feature on new equipment or adapted to Impackers and scales already in use.

•

Tal Portable Motor Pump

Tal Blending Equipment, Inc., Milwaukee, has developed a portable hydraulic motor pump that develops up to 10,000 p.s.i. pressure and weighs only 65 pounds. The pump is driven by a standard one-half H.P. single phase, 60 cycle, 1750 R.P.M., 110-22-volt motor.

•

Kennedy Conveyor Bulletin

The Kennedy Van Saun Mfg. & Eng. Corp., Danville, Pa., has published a new bulletin illustrating Kennedy's method of air-gravity conveying dry, pulverulent materials. Kennedy's special porous plate conveying surface is described along with other principles of materials handling.

Now Meet Grower Demand with GIBREL® Emulsifiable Concentrate

New Spray Formulation—

GIBREL Emulsifiable Concentrate is the newest Merck formulation developed especially for use in foliar sprays. It contains approximately 4 Gm. potassium gibberellate per quart (0.5% active ingredient on a weight-by-weight basis).

Economical and Easy to use—

Where a known level of treatment is needed, sprays containing GIBREL Emulsifiable Concentrate offer simplicity and economy of use. They are safe to handle, and nonphytotoxic. The Concentrate contains solvents, surfactants and expanders. It is immiscible in water and will not settle out in the spray tank, ensuring full and uniform treatment.

It may be used in aircraft and low-pressure ground spraying equipment. Suitable for use with other sprays, it is compatible with commonly used insecticides, fungicides and fertilizers.

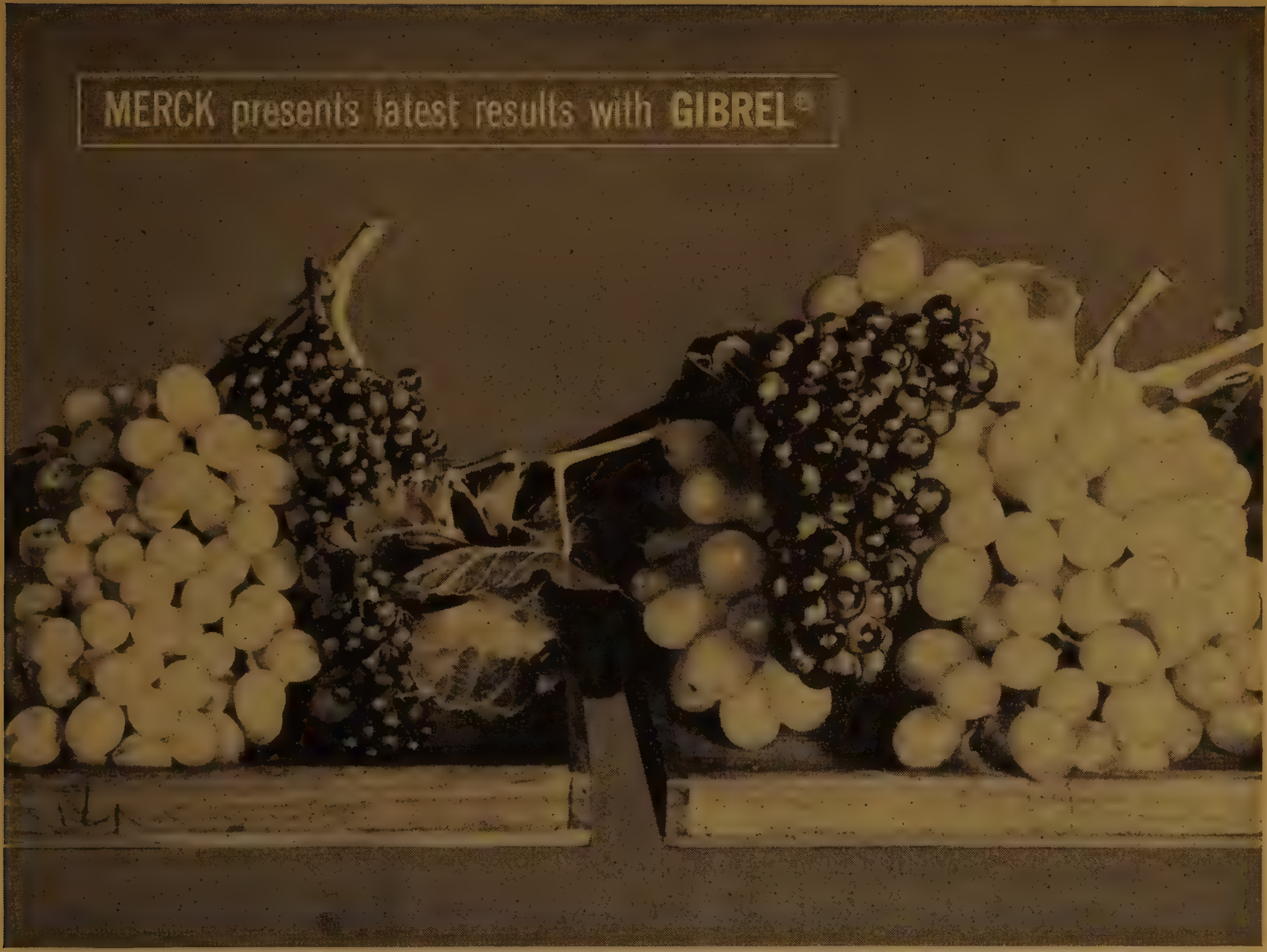
SEND FOR MORE INFORMATION

Write, wire or phone your nearest Merck Sales Office for detailed information about GIBREL Emulsifiable Concentrate.

MERCK & CO., INC.

Sales Offices in

Rahway • Los Angeles
St. Louis • Atlanta • Boston
Chicago • Minneapolis
Philadelphia
San Francisco



A premium market awaits the magnificent clusters of high-quality Thompson Seedless and Black Corinth grapes resulting from a single spray of Gibrel. *Although the large treated grapes at right were grown without costly girdling, they are nearly twice the size of those at left which were produced by using traditional practices.*

GIBREL

Promises Higher Profits for Farmers Everywhere

The experience of California grape growers is a striking example of how Gibrel promises higher crop yields and greater profits for farmers all across the country.

Thompson Seedless and Black Corinth grapes of California are naturally small in size and yield. To market a profitable crop, growers have been compelled to employ such practices as girdling and bunch-pruning—effective but costly measures for increasing berry size and yield. Here's how Gibrel has changed the picture.

A single spray of this new growth stimulant eliminates the need for girdling, and produces a crop equal in berry size and yield to that obtained from traditional practices. Even more impressive, a heavier spray of Gibrel gives up to twice the size and yield with the same high quality (as judged by sugar and acid content), and a chance for growers to develop a premium market.

Many other crops respond to seed treatment or foliar sprays of Gibrel. Its "vitamin-like" effect often triggers a plant's characteristic growth—promises such results as increased size and yield of many fruits and vegetables, earlier emergence for a better stand, shorter growing period, and faster early growth even in the face of adverse weather.

How practical is Gibrel for the crops you grow? Merck's extensive research program, including large-scale field trials on a wide variety of crops, is providing the answers right now. Check with your agricultural chemicals supplier for more information—and formulations of Gibrel tailored to your needs.

© 1958, Merck & Co., Inc.

® Merck & Co., Inc. for its brand of gibberellin plant growth substance.

MERCK & CO., Inc.
Rahway, New Jersey

GIBREL® – a product of MERCK

STOP SIFTING!

PACK POISONOUS POWDERS SAFELY IN **DUOTITE BAGS** BY SHELLMAR-BETNER

You can't take chances when you're packaging poisonous powders. Sifting can be dangerous!

That's why you should use Duotite bags by Shellmar-Betner. Duotite bags are of rugged construction with or without special liners to meet your product specifications. They have double-folded bottoms secured by both heat seal and adhesive. They're durable, too — give strong resistance to breakage.

Duotite bags look neat and trim. And with Shellmar-Betner's expert printing they have plenty of sales appeal. Call on Shellmar-Betner for the best package for poisonous powders and other special chemical products.

CONTINENTAL CAN COMPANY
SHELLMAR-BETNER DIVISION
DEVON PENNSYLVANIA • MT. VERNON, OHIO • SOUTH GATE, CALIFORNIA

QUALITY PRINTERS AND CONVERTERS
OF FLEXIBLE PACKAGING MATERIALS

Soil Properties Booklet

A booklet describing the physical properties of 134 soils in six Northeastern states is being offered by the Northeastern Forest Experiment Station, Upper Darby, Pa. The booklet is Station Paper No. 89.

From June 1954 to July 1955, samples of the soils were collected and analyzed to supply the U.S. Army with information needed for research on military trafficability. The basic data is presented in the booklet because of the interest to soil scientists. In addition, relationships between bulk density and soil texture and organic content are presented.

■

Polyethylene Shipping Bags

Industrial shipping bags fabricated from 10-mil polyethylene film now are available commercially from Chippewa Plastics Inc., Chippewa Falls, Wisc.

The bags conform to specifications established last month by the Railroad Joint Classification Committee. Chippewa has announced that the Monsanto Chemical Co., operating under test shipping permits for several months, has used the bag successfully to ship a number of its products. So far, Monsanto has experienced no breakage, the company said.

■

Lift Truck Shock Absorbers

Greerolator shock absorbers, manufactured by Greer Hydraulics Inc., Jamaica, N. Y., have been installed on some lift trucks to absorb sudden surges of hydraulic pressure in the lift circuit of the trucks. By absorbing shocks, the device is said to eliminate high maintenance costs caused by damaged trucks and dropped loads.

Vibrations and shock are reduced through the use of a newly developed hydro-pneumatic accumulator installed in the hydraulic pressure line.

■

Humidity Indicator Card

The Andrew Technical Supply Co., Chicago, is offering a new humidity indicating device called "Humigraph."

It is a card, size 2 by 6 inches, having seven indicator spots whose color changes from blue to pink as the atmospheric humidity changes. The card is scaled to show relative humidity by reference to the color change spots. It reads from 10 to 80 per cent relative humidity, and works at temperatures from 40 to 200° F.

■

Towmotor Safety Features

The Towmotor Corp., Cleveland, has announced that eleven of the company's fork lift trucks have been granted Underwriters' Laboratories approval for special safety features.

One of the major optional safety features available on the trucks is a special exhaust system that employs a dry type muffler and a spark and flame arresting tail pipe. Also available are extra-rigid fuel tanks, safety filler caps, and non-conductive battery cover plates.

■

Spray Drift Damage Leaflet

Full advice and information on preventing spray drift damage to crops is given in a leaflet obtainable from the Ministry of Agriculture, Fisheries and Food, 23 Soho Square, London, W. 1.

Poulsen Equipment Catalog

The Poulsen Co., Los Angeles, has prepared a catalog of their specialized processing equipment.

Included among the Poulsen complete plant types are; standard and dual compounding plants, liquid formulating plants, and feed milling plants. Also available are processing plants for mixing, grinding, blending, processing, compounding, sifting, and packaging fertilizers. In addition, Poulsen components can be supplied separately.

●

Redesign Fertilizer Bag

The Pelham Phosphate Co., Pelham, Ga., recently adopted a new package design for its complete line of fertilizer products.

The new design was created by the Union Bag-Camp Paper Corp., New York, and features a liberal use of color. In addition, the new design gives product and analysis information at both ends of the bag as well as in the gussets. This insures immediate identification of the product in the warehouse.

STRONG, SIFT-PROOF BAG CLOSURES!
for Automatic, Square or Flat Paper Bags

IDEAL FOR THESE PRODUCTS:
Insecticides, Fertilizers,
Chemicals, Cement Paints,
Wheat Paste, Milk Powder,
Dog Foods, Briquets,
Corn Meal, Powders and
other granular products.

PROVEN PERFORMANCE!

FRY MODEL CSG

EXIT VIEW

Sift-proof because it double-folds, heat seals and glues on heavyweight coated or lined paper bags. Double-folds and glues only on plain kraft bags. **Strong** because the second fold is glued to the first adding shipping and carrying strength to powder tightness. And the closing operation is continuously automatic!

WRITE FOR FREE BROCHURE TODAY!

GEORGE H. FRY COMPANY

42 East Second Street, Mineola, N. Y. — Pioneer 6-6230

DOW
VERSENOL FA
An iron chelate for dry use and fertilizer mixing
Controls iron deficiency of trees and plants
for use on
either acid or alkaline
soils
50 LB.

Put new vigor in your fertilizer sales with Versenol

Adding just small amounts of Versenol® products to your regular fertilizer formulas makes a big difference when you start counting repeat sales.

By supplying a fast, lasting supply of iron to depleted soils, Versenol makes customers sit up and take notice. Citrus growers, truck gardeners, nurserymen, landscapers will see plants, shrubs and trees change to a healthy, rich green. And they'll come back for your brand to keep them that way.

Dow makes two formulations: Versenol F for mixing into liquid fertilizers and Versenol FA for mixing with dry fertilizers. Both of these forms of Dow iron chelate provide fast first aid to either acid or alkaline soils suffering from iron deficiency. And they supply this iron to plants more uniformly and effectively than inorganic sulfates.

You'll be surprised to learn how little Versenol F or Versenol FA it takes to give your fertilizer formulas this added sales advantage. For complete information, write directly to: THE DOW CHEMICAL COMPANY, Agricultural Chemical Sales Dept., Midland, Michigan.

WEED AND BRUSH KILLERS, SOIL FUMIGANTS, GRAIN FUMIGANTS, INSECTICIDES, FEED ADDITIVES, ANHYDROUS AMMONIA, DEFOLIANTS

Dow presents
The Red Foley Show
every Saturday. See radio listing for time and station.

YOU CAN DEPEND ON DOW

Portland Drum Reconditioner

The Portland Co., Portland, Me., has prepared a bulletin describing the Portco Drum Reconditioner. The machine automatically strips paint from the outside, cleans contents from the inside, and rinses and dries both interior and exterior of packages with a single handling.

The reconditioners are available in six standard models that handle from one to six drums at a time.

■

Joy Compressors Bulletin

The Joy Manufacturing Co., Pittsburgh, recently published a bulletin which provides detailed information on Joy's heavy-duty, high pressure, stationary compressors. The eight-page bulletin includes specifications on four basic high pressure models which range in capacity from 368 to 2000 CFM.

WASHINGTON REPORT

(*From Page* 43)

also raises the threat of invasion by destructive pests. He recalled that in 1923 plant quarantine inspectors boarded 8,300 vessels. Last year they inspected 56,000 vessels.

"The more we trade, the more ships, planes, railroad cars, trucks, and autos enter our ports and cross our borders—the more we must be on guard against insect hitchhikers." Benson warned that "we cannot afford losses like that caused by the corn borer in 1957—estimated at nearly $120 million. Nor such losses as are caused by the bollworm—estimated in a recent year at $750 million."

In unexpected recognition of the threat of pests to American agriculture, Secretary Benson added that agricultural pests "could literally cripple our agriculture. They can spell the difference between abundance and scarcity, between an economy of plenty and an economy of want."

He credited science with providing many "valuable new techniques" for pest control, including "a wealth of useful pesticides."★★

EDITORIAL

(*Continued from Page* 27)

believe, be able to anticipate a strong resumption of the upward trend. The continuing program of the National Plant Food Institute to expand the national market is now getting into high gear, and should contribute in a substantial way to expanding fertilizer sales over the coming decade.

WACA MEETING

(*From Page* 72)

The "Three M" problem is still associated with Farming — Management, which must be on a higher level; Money — the use of capital as a tool for production; and Materials — growers must use the materials and chemicals needed to gain these goals. Mr. Coke feels that western agriculture is in strong hands. Currently, 80% of California's income is from crops not supported by government programs.

Discovery, Evolution of New Pesticides

Dr. Richard W. Young, American Cyanamid Company, Stamford, Connecticut, gave his listeners a "chemists-eye view" of the activities in the research laboratory. What types of compounds are considered? A majority of those investigated are basic company productions developed for other uses, or the synthesis of other chemicals, which are basic for the company. Additional compounds may be developed also because of an interesting structure, or from compounds synthesized for special work in progress elsewhere in the company.

It is the job of the organic chemist to develop leads to show interesting activity in the tests used. Superior chemicals which will achieve the most desired results will be developed only when more of the behavior of chemical componds is known after they are introduced into the system of pests, plants, or other unwanted forms of life.

Dr. Young stated that we are not evaluating all the chemicals avail-

it's... magnesia for greater yields

Year after year Berkshire's EMJEO* (80-82% Magnesium Sulphate) and Calcined Brucite (fertilizer grade) 65% MgO have proved to be invaluable primary plant foods—together with nitrogen, phosphorous, and potash.

it's... BERKSHIRE for highest quality magnesia

Be sure to include Berkshire's EMJEO and/or Calcined Brucite (fertilizer grade) 65% MgO in your mixtures as sources of available magnesium. You'll be glad you did.

it's... and BERKSHIRE'S POTNIT*

(94/95% Nitrate of Potash) for special mixtures and soluble fertilizers.

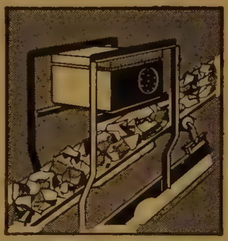
*Trademarks Reg. U.S. Pat. Off.

Berkshire Chemicals
INC.

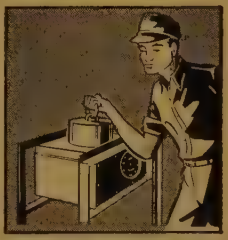
420 Lexington Ave.,
New York 17, N. Y.

Sales Offices: New York
Chicago • Philadelphia
Cleveland • Boston • Pittsburgh
San Francisco

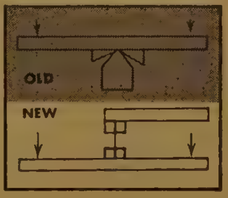
NEW Thayer Inventory Scale



Totalizes continuously and accurately any material being conveyed on an endless belt. Newly designed Thayer Scale fits over level or inclined systems at any location for direct or remote reading. Thayer Scales of 100 lbs. or 300 tons per hour capacity are available.



Recalibrates linearly with direct setting by just placing a known weight on the scale platform. The belt is not disturbed. No chains or involved calculations are necessary. Setting is positive, accurate, and long lasting.



Exclusive Thayer Plate Leverage System is guaranteed accurate for the life of the scale. There are no knife-edge pivots to wear down. Neither dust nor dirt nor vibration can affect its high accuracy. Thayer Scales are unsurpassed for simplicity and reliability under rugged conditions.

Write us about your bulk weighing problems for inventory or batching purposes.

THE Thayer SCALE

*THE THAYER SYSTEM OF PROCESS CONTROL BY WEIGHT

AUTOWEIGHTION

THAYER SCALE CORP., 4 Thayer Park, Pembroke, Mass.

able. There are still a number of potentially useful compounds sitting around "unknown" on laboratory shelves. Additional funds of information are needed for future work—the "how" and "why" a compound works—in order to secure more information for formulation data and other uses.★

HERCULES OUTLOOK

(From Page 39)

5. Farmers are concerned about the increasing cost of satisfactory insect control. Shopping for price alone is not the answer. Farmers who have found a supplier of quality formulations who provides technical service have discovered that, although the price per pound may be slightly higher, the season's insecticide bill turns out to be substantially lower. One application made at the *right time* is equal to several applications made hit or miss.

It is dangerous to generalize about an area as vast as the Cotton Belt. However, in several important cotton-growing regions we believe 1958 will be remembered as the season when insecticides were used more intelligently than in previous years. Buying seems to be on a more orderly basis than before, with a good movement of materials for application early in the season. We expect the efficient use of these materials to lessen the threat of insect outbreaks at mid- and late-season. If this holds true there will not be such a frantic last-minute rush for insecticides in July and August, with the resulting bottleneck where demands are hard to meet, and insects much more difficult to control.

Again, it is too early to predict what effect June weather will have on boll weevils. However, on farms where a program has been carried on to keep the overwintered weevils in check, we feel certain that the only late-season threat will occur if migrating weevils move from fields where insect control has been inadequate. Even if this happens, the farmer on a *complete* program has the great advantage that his crop is mature or near maturity, and can be protected effectively at a modest cost.★

W. R. Carlisle has joined Falls Industries, Inc., Solon, Ohio, as a sales engineer for Ohio, West Virginia, and Western Pennsylvania. He formerly was with E. I. du Pont de Nemours & Co., Allied Chemical Corp., and the Foxboro Co. in engineering and sales capacities.

AGR. AVIATION

(*From Page 55*)

equipment, chemicals, pilots, customers, management yardsticks, and better business. This fall, NATA will try again to remove this obstacle.

The biological warfare, in which we are engaged, demands better ammunition, guns, and gunnery. The airplane has the unique capability of spreading a little chemical over a lot of acreage in a short time. Now, however, we need products designed for high speed application in low volume and aircraft with better takeoff and landing capabilities that pack bigger loads. We need dispersal systems that give wider swaths and application techniques that do a better job of getting the chemical where it belongs. A host of applicating jobs are denied us for lack of the appropriate chemical or the necessary technique. Technological improvement is a never-ending obstacle course in survival.

One of our greatest obstacles is a reluctance to band together in the pursuit of common goals. Our indifference and, in some cases, even active opposition to association with others in our own and related industries has led us into perilous straits. We have ignored the strength of union. By cooperative effort in our trade association, we could have become strong and rich. Instead, the majority pursued its individualistic way and, as a result, we stand weak and poor, fighting for our right to survival.

There still is vibrant life in agricultural aviation, but unless we mass our strength and wealth by joining and supporting NATA in a wholehearted manner at the national level, and our state associations at that level, we shall not long enjoy it. We can

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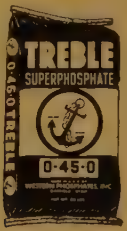

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no longer ignore the enemies arrayed on the line of battle nor do we have the option of choosing the battle ground. The struggle, as a matter of fact, already is under way in Washington. Lesser battles are being fought in the state capitals and in New York, Kansas City, Fort Worth, and Los Angeles. All are contests of vital interest to the individual applicator. On their outcome hangs his right to survival. Those small and valiant numbers who already are in action need the help of every other applicator. The cost will not be low, nor the fighting soon finished. We have waited too long, held back too much, and aided too little for that.

Yet the fight can be won if we will now do what we must. Association is the price of survival. When that survival is assured, agricultural aviation will be free to grow into the unique, significant service that our civilization can use so profitably.

HERBICIDES

(From Page 55)

tively short period of time appears entirely possible—provided initial removal of the brush, usually by burning—is followed by successful reseeding in the late fall and by aircraft spraying for sprout and seedling control in the spring.

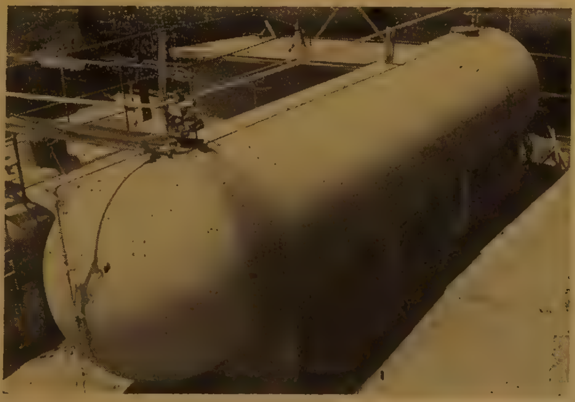
The tests were conducted by O. A. Leonard, associate botanist, University of California, Davis, and C. E. Carlson, forest technician, California Division of Forestry, Sacramento. They are reported in the April, 1958, issue of *California Agriculture*. . . .

SURFACTANTS

(From Page 32)

a given pesticide, but in many cases it has been shown that a surfactant will make the difference between success and failure of a treatment. In general, we are inclined to think that a surfactant will give us a slight increase in effectiveness, but more detailed studies in recent years have demonstrated that surfactants may increase the effectiveness of a material by 50% or more. This has been true generally of use with all types of pesticides.

We are beginning to build a large body of experience indicating that certain types of surfactants are more effective with a given pesticide. In order to obtain the maximum efficiency from a pesticide application, then, an agriculturist will want the latest information on the best surfactant to be used with the pesticide which he intends to apply.★★.



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THE SALESMEN'S ASSOCIATION of the American Chemical Industry will hold its annual dinner dance on Nov. 7 at the Waldorf-Astoria Hotel, New York, and its annual Christmas party on Dec. 17 at the same hotel.

1858 OUTLOOK

(From Page 36)

trol of rust mite on citrus; and Simazine, a relatively new herbicide, which seems to show much promise both industrially and in agriculture. The Niagara Division of Food Machinery & Chemical Corp. likewise has an extremely fine miticide in a new material called "Tedion," which is gaining wide popularity in the citrus industry for the control of red spider, six-spotted mite and Texas mite. There are other new materials which also look promising, but the products mentioned are the potential volume items that come first to mind at this time.★★

FOREST FERTILIZATION

(From Page 41)

vince of New York were fertilized in the early summer of 1954 with granular muriate of potash fertilizer. The material was applied by aircraft at a rate of 200 pounds per acre. An analysis of the contents of soil and foliar potassium before and after treatment reflected significant uptake and a satisfactory distribution of the material. Improved growth of trees following treatment was indicated by better color and increased needle length after a single growing season.

The culture of lupine, Scotch broom, and other legumes has long been advocated by European foresters as a means of improving the fertility of unproductive forest soils. Experiments with a variety of legume crops were initiated in Wisconsin in the spring of 1945. The experience gained during the first three years of the test indicated that from an economic standpoint the red clover was the most suitable green manure crop. Consequently, it was used at all trials. The fertility of the soils proposed for reforestation was first augmented by the application of limestone. In the majority of cases, the treatment included an equivalent of two tons of lime and 400 pounds per acre of 0-9-27 fertilizer. The survey of the established red pine plantations, made in the fall of 1954, revealed that the green manuring failed to fulfill expectations. The green manure provided ideal ground for white grubs which contributed to a decreased survival rate of growth on fertilized areas. Spectacular results achieved in 1955, however, in controlling white grubs by the use of a one per cent emulsion of aldrin may place the use of fertilized legumes among the important methods of forestry improvement.

A task force on forest fertilization appointed by the National Plant Food Institute, reported last year that there is a very critical need for still more research to define the areas or conditions under which responses to fertilizer by forest trees may be expected. Even when trees are found to respond to fertilizers, the NPFI report continued, the ultimate question is whether or not the response is great enough to give an economic return. The information available at this time, however, suggests that forestry may, indeed, represent a large potential market for the fertilizer industry.★★

GLF OUTLOOK

(From Page 34)

large volume movers which were not in the agricultural field a few years back.

Diazinon for fly control in dairy barns has proved very successful. With us, Dipterex bait has been very readily accepted. Korlon is promising, but has not been present long enough to establish a trend.

Soil insecticides for vegetable growers and some owners and for special uses such as European chafer control are becoming very popular, with heptachlor, chlordane, dieldrin and aldrin all becoming rather large volume items.

Soil fumigants such as Vapam, VPM and Mylone among the newer

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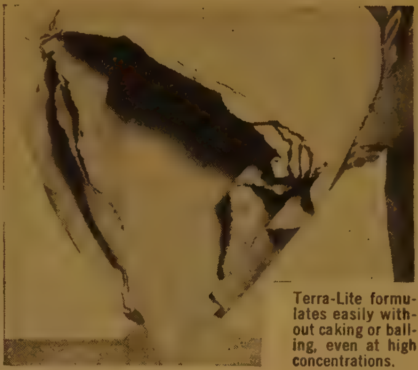

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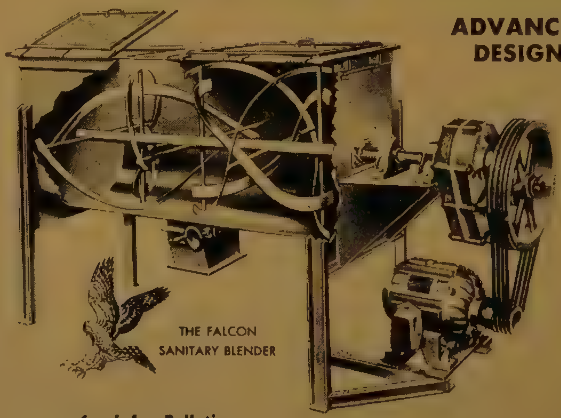

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materials are finding uses for specialty growers and plant bed growers. Telone is rapidly becoming known for large acreage usage along with EDB and DD.

Soil fungicides to date have not quite managed to make a big impression on growers either due to high costs or limited usefulness. We feel that here is a place where some real volume exists if we know how to get it. We will need to demonstrate the usefulness of soil fungicides and find materials which can give consistent and good performances.

Dessicants for beans are ahead of the application technique and equipment owned by bean growers. Potato vine killers for the most part are arsenicals with volume dependent on season. We do not have a safe and satisfactory onion top dessicant, although a market exists and growers are begging for such a material.

Fruit thinning compounds vary with each season and we see no great increase in their overall use, nor do we see a further expansion in use of compounds to keep fruit from dropping. There are some indications that chemicals will find greater use as sprout inhibitors.

The antibiotics have not proved to be big volume items with us, and we see at present only a gradual increase in their use. If we had an outstanding material I am sure it would be accepted readily by either fruit or vegetable growers.

We have seen no indications that growers intend to use less chemicals and we have seen a tremendous increase on the use of chemicals on the part of the average home owner.

We have a tremendous potential for agricultural pesticide chemicals in a great many areas as soon as we can get satisfactory chemicals.★★

POTASH SIZES

(From Page 30)

The coarsest was essentially a minus 6 plus 20 mesh product. The intermediate muriate was a minus 8 plus 20 mesh; and the smallest size muriate was essentially a -10/48 mesh product.

The 5-20-20 mixture was formulated from anhydrous ammonia as the sole source of nitrogen. Normal and triple superphosphates were used as the sources of phosphate. Sulfuric acid and water were added to promote agglomeration. The amount of water used was the sole variable. The water rate was adjusted to yield the best results for each type of potash used. Normal plant operating procedures were followed in these studies. The plant was operated at a capacity of 20 tons of product per hour.

All three sizes of granular muriates resulted in equally satisfactory plant operation. The amount of water required for granulation was about the same for each of the granular potash products tested. The recycle load was the same for all of the granular potash products studied.

The 5-20-20 products made with granular potash were angular and irregular in appearance and contained appreciable amounts of uncoated potash crystals and exposed potash surfaces. The use of the smallest size granular potash resulted in a product containing considerably less exposed potash than the use of the two larger sizes of granular muriate. On the basis of appearance, plant operators stated that the smallest size granular muriate was most suitable. All of the products made with granular potash were very similar in particle size distribution; approximately 70 per cent of the product was in the minus-6-plus-10 mesh range in each case. Each of the products made with granular potash contained approximately the same amount of moisture.

In regard to plant food distribution, the potash accumulated in the product particle size fractions approximating the size of the granular potash raw materials. In general, the potash content of the larger particle size fractions of the product was higher than the desired amount; whereas the smaller particle size fractions were deficient in potash. The phosphate content varied inversely with the potash content in the various screen fractions. The nitrogen was fairly evenly distributed through-

From stitching area to the waiting truck is a simple handling job when it is done on an Oliver-Farquhar Model 431 and Expand-O-Veyor as shown here.

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double bag handling capacity with less manpower!

As the waiting truck is filled up, the extended boom of the Expand-O-Veyor is telescoped into the basic unit to reduce the length of the conveyor to the desired, easy-handling, position.

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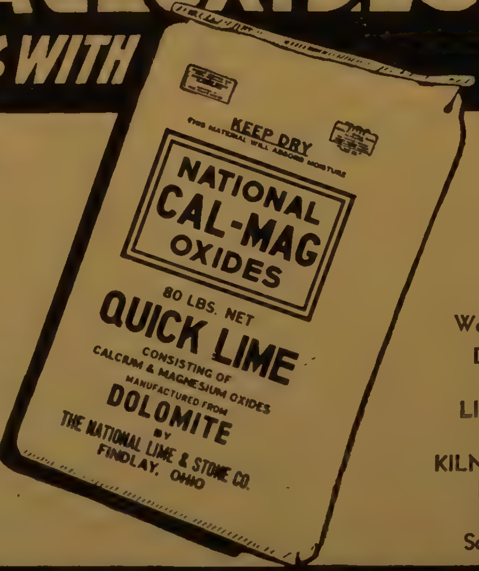

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out all of the product and recycle particle size fractions.

From the standpoint of plant food distribution throughout the product and recycle, the intermediate size granular potash proved to be most satisfactory. The largest particle size potash gave a product with an over-abundance of potash in the larger particle size fractions and a deficiency of potash in the smallest particle size. Granular muriate resulted in a product containing too little potash in the coarser particle size fractions and too much potash in the smaller screen size fractions.★★

LISTENING POST

(From Page 64)

treated similarly pruned Pillar No. 7 bushes from open cold storage stacks were planted in an adjacent row. The bushes were watered after planting and several times during the season. During July and August vigor and bloom were rated periodically.

Results and Discussion: Tables 1 and 2 show results of the laboratory tests. Of the non-volatile chemicals Captan 50W produced greatest inhibition of *Botrytis* growth in culture; of the volatile chemicals biphenyl was most effective. As shown by the regrowth data in Table 2, at the higher concentrations ammonium carbonate, I-KI, and sodium bisulfite were fungicidal, and biphenyl and dimethyl dichlorosuccinate were fungistatic.

Results of the storage experiments are given in Table 3. Bushes were treated after they had been stored for 3 months and exposed to considerable inoculum. Dip treatments are rated in the table by comparison with water-immersed control plants, since *Botrytis* growth was heavier on controls packaged after dipping in water than on controls packaged dry. The most effective dip treatments on this basis were Dowicide A and Mycostatin. The volatile chemicals and Terraclor and captan dust were also effective. *Botrytis* growth was much less on captan-dusted dry-packaged plants than on captan-sprayed plants sealed in the bags while wet.

Subsequent growth and blooming in the field was best with captan dust. Captan dust was the least injurious of the vapor and dust treatments. The number of vigorous plants was greater from dry-packaged than from wet-packaged control plants. Production of 132 (or 88 per cent) vigorous blooming bushes from the 150 untreated Pillar No. 7 plants from open cold storage stacks is comparable with growth of dry-packaged control plants. Captan dust and dip treatments with Kromad, Vancide 51, or Mycostatin were most effective in protecting dormant roses in polyethylene bags in cold storage from gray mold.★★

Table 3. Control of Botrytis sp. in cold storage rosebushes.

Chemical	Application method	Concentration	Botrytis growth[a]	Rosebush growth[b]
		ppm/water[c]		
Kromad	Dip	4800	1.3	8
Captan 50W	Dip	4800	2.7	6
Vancide 51	Dip	4800	1.3	8
Thylate	Dip	4800	2.3	5
Dowicide A	Dip[d]	1250	0.7	3
Mycostatin	Dip	500	0.7	7
Control (water)	Dip	—	4.0	4
		grams/bag		
Biphenyl	Vapor	10	0.0	4
Biphenyl	Vapor	5	1.0	4
Sodium bisulfite	Vapor	20	0.3	0
Ammonium carbonate	Vapor	20	0.0	0
Captan (7.5% dust)	Dust	—	1.0	8
Terraclor (20% dust)	Dust	—	0.3	4
Control (dry)	—	—	3.0	7

[a] Average of three bundles. 0 = no *Botrytis* growth on surface of plants; 1 = up to 25% of surface area covered by *Botrytis* growth; 2 = 26% to 50%; 3 = 51% to 75%; and 4 = 76% to 100%.

[b] Number of vigorous plants out of nine planted.

[c] Concentration based on weight of commercial product.

[d] Tops only.

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Rates for classified advertisement are ten cents per word, $2.00 minimum, except those of individuals seeking employment, where the rate is five cents per word, $1.00 minimum. *Check must accompany all classified advertisements.* Address all replies to Classified Advertisements with Box Number care of AGRICULTURAL CHEMICALS, P. O. Box 31, Caldwell, N. J. Closing date: 10th of preceding month.

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Southern States To Build

Southern States Co-operative, Richmond, Va., has announced plans to erect a granular ferilizer plant — with an annual production capacity of 60,000 tons a year Russellville, Ky.

The plant is expected to go into production next spring. Southern States now operates seven mixing plants in its six-state territory, but this will be its first granular unit. It is expected to cost $750,000.

•

Bear Tells Growth Plans

Stuart H. Bear, recently named general manager of the Niagara Chemical Division of Food Machinery and Chemical Corp., Middleport, N. Y., said last month that the division would continue to grow through expansion of research, acquisition of new products for development, and by vigorous sales effort.

Mr. Bear joined Niagara 27 years ago as an assistant territory salesman in western New York and has held various sales positions including the district managership of all midwestern states. He became assistant sales manager of the Niagara Division in 1947.

•

Hold Koos Case Open

Acting Circuit Judge Henry A. Detling of Sheboygan, Wisc., has decided to hold open the question of whether a receiver should be appointed for the N. S. Koos & Son Co., Kenosha, Wisc., and the present officers removed from control.

He ruled that the plaintiffs, who are minority stockholders of the fertilizer manufacturing company, have the right to supplement their original complaint with matters that have occurred since action was commenced a year ago. The audited report for 1957 shows that the company suffered a net loss of $161,729.61.

It was also ruled that what were described as excessive salaries and bonuses which the present officers are alleged to have paid themselves, from 1953 to 1956, must be repaid to the company with interest.

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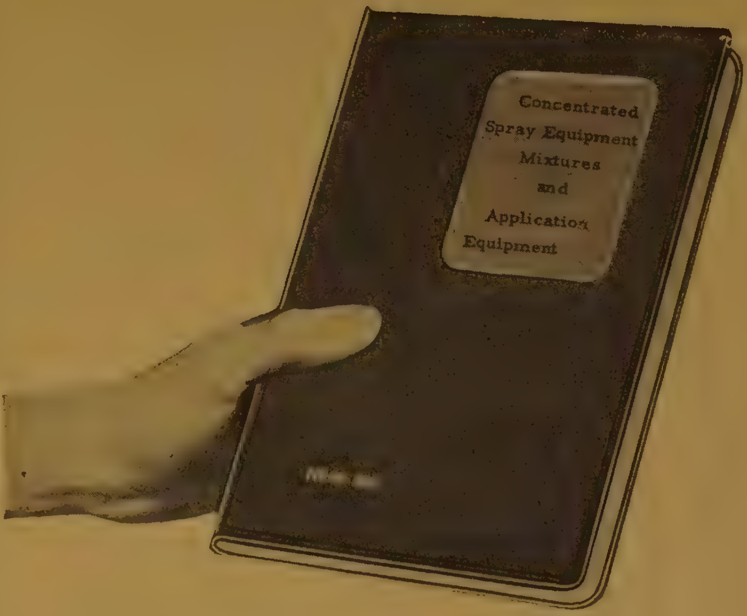

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Samuel Frederick Potts, author of this new book has been in the agricultural chemicals industry for more than 30 years. He has published more than 70 articles, booklets, etc., on various phases of the industry. He has also been instrumental in designing new equipment and improvements in equipment for the application of agricultural chemicals.

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INDEX to ADVERTISERS

Allied Chemical Corporation—Nitrogen Division ..... between 70 & 71
American Agricultural Chemical Co. 25
American Cyanamid Co. 26
American Potash & Chemical Co. 58
Antara Chemical Div., General Aniline & Film Corp. ..... May
Armour & Co. ..... May
Ashcraft-Wilkinson Co. 10

Bagpak Div., International Paper Co. ..... 2nd Cover
Baugham Manufacturing Company 122
Bemis Bros. Bag Co. 106
Berkshire Chemicals, Inc. 117
Blue Valley Equip. Mfg. & Engr. Co. 80
Bradley & Baker 54
Bradley Pulverizer Co. 18

Chemical Construction Corp. 88
Chase Bag Co. 95
Chemical Insecticide Corp ..... May
Chemagro Corp. 48
Clark Equipment Corp. ..... May
Colloidal Products Corp. 79
R. D. Cole Mfg. Co. 121
Combustion Engineering, Inc. Raymond Division 44
Commercial Solvents Corp. 16
Continental Can Co., Shellmar Betner Div. 114
Cox, Dr. Alvin 129
Crown Zellerbach Corp. ..... Mar.

Davidson-Kennedy Co. 98, 99
Davies Nitrate Co., Inc. ..... Apr.
Davison Chemical Co. Div. of W. R. Grace & Co. 97
Diamond Alkali Co. 60, 61
Dodge & Olcott, Inc. ..... May
Dorr-Oliver Co. 108
Dow Chemical Co. 116
Du Pont de Nemours & Co. ..... May
Duval Sulphur & Potash Co. 10

Eastern States Petroleum & Chemical Corp. ..... May
Eastman Chemical Products, Inc 20
Emulsol Chemical Corp. 46
Escambia Chemical Corp 122

Fairfield Chemical Div., Food Machinery & Chemical Co. ..... May
Falcon Manufacturing Co. 124

A. B. Farquhar Division, The Oliver Corp. 125
Floridin Co. ..... May
Frontier Chemical Co. 84
Fry Co., Geo. H. 115

Geigy Agricultural Chemicals 17
General Chemical Division—Allied Chemical Corp. ..... May
General Reduction Company 107
Glendon Pyrophyllite Co. 109
Glenn Chemical Corp. ..... April
Grace Chemical Co. 90
Grand River Chemical Division of Deere & Co. ..... Apr.
Greeff & Co., R. W. ..... May
Grinnell Co. ..... May

Hercules Powder Co. ..... 4th Cover
Hooker Electrochemical Co. 56
Huber, J. M. Corp. 103

International Minerals & Chemical Corp. 6, 7, 11, 74, 92, 93
International Ore & Fertilizer Corp. 82

Johns-Manville Co. 83

KLM Royal Dutch Airlines 130
Kolker Chemical Corp. ..... May
Kraft Bag Co. 13

Magnet Cove Barium Co. 78
McDermott Bros. ..... Apr.
Merck & Co. 112, 113
Michigan Chemical Corp. ..... Apr.
Miller Chemical & Fertilizer Corp. 119
Monsanto Chemical Co. ..... Apr.
Munson Mill Machinery Co. ..... May
Mine Safety Appliances Co. ..... May

National Aniline Division—Allied Chemical Corp. 12
National Lime and Stone Co. 126
National Potash Co. ..... 3rd Cover
Niagara Chemical Division, Food Machinery & Chemical Corp. ..... May
Ninol Laboratories, Inc. ..... Mar.
Nitroform Agricultural Chemicals, Inc. ..... Mar.

Olin-Mathieson Chemical Corp. 91

Penick, S. B. & Co. 24
Pennsalt of Washington Division, Pennsalt Chemicals Corp. ..... Apr.
Penola Oil Co. 23
Phelps Dodge Refining Corp. 89
Phillips Chemical Co. 68, 69
Planters Fertilizer and Phosphate Co. 121
Potash Company of America 3
Poulsen Co. ..... May
Prentiss Drug & Chemical Co. 14

Raymond Bag Corp. ..... Apr.
Raymond Division, Combustion Engineering, Inc. 44
Republic Chemical Corp. 124
Republic Steel Corp. 124
Renneburg & Sons Co., Edw. ..... May
Reideburg, Theodore Associates 96, 129
Richardson Scale Co. 126
Rohm & Haas Co. ..... May
Richfield Oil Corp. 128

A. J. Sackett & Sons 9
Sedberry, J. B. Inc. ..... Feb.
Shell Chemical Corp. 21
Sinclair Chemicals, Inc. ..... Mar.
Snell, Foster D., Inc. 129
Southeastern Clay Co. 128
Southwest Potash Corp. 102
Spencer Chemical Co. ..... May
Sperling Laboratories 129
Spraying Systems Co. ..... May
Standard Oil Co. (Indiana) 86
Standard Agricultural Chemicals, Inc. ..... May
St. Regis Paper Co. 111
Sturtevant Mill Corp. 110
Summit Mining Corp. 105

Tamms Industries Company 128
Tennessee Corp. 22
Texas Co. 8
Texas Gulf Sulphur Co. 66
Thayer Scale Co. 118
Thomas Alabama Kaolin Co. 85
Thompson, Friar M., Jr. 129
Townsend, Dr. G. R. 129

Union Bag-Camp Paper Co. 100, 101
Union Carbide Chemical Co. ..... Mar.
United-Heckathorn 52
U. S. Borax & Chemical Corp. ..... May
U. S. Industrial Chemical Co. ..... Apr.
U. S. Phosphoric Products, Div. Tennessee Corp. 63
U. S. Potash Co. 19

Vanderbilt Co., R. T. 94
Velsicol Chemical Corp. 4
Victor Chemical Works ..... May

Webrib Steel Co. ..... Apr.
West Virginia Pulp & Paper Co. 73
Wilson & Geo. Meyer & Co. 120
Wisconsin Alumni Research Foundation 128
Dr. Wolf''s Agricultural Labs 129
Woodward & Dickerson, Inc. ..... May

Yale & Towne Mfg. Co. 104
Young Machinery Co. ..... May

Zonolite Co. 123

TALE ENDS

THE biggest meeting of the year in the agricultural chemical field is just a few weeks off, as this issue of AGRICULTURAL CHEMICALS goes to press. We refer, of course, to the annual meeting of the National Plant Food Institute, which will be held as usual at the Greenbrier, White Sulphur Springs, W. Va., June 15-18.

If your reservation isn't already in order, you better think in terms of some nearby motel, for even the capacious Greenbrier can't handle the tremendous crowd that gathers each year for this big fertilizer industry gathering.

But come along anyhow, and toss in your bathing suit and golf clubs. A bottle of drinking whiskey is a thoughtful precaution too, if your're planning to arrive on Sunday for keep in mind that the state liquor store won't be open.

AC

Thanks to a series of subscribers for their nice compliments on A. W. Mehring's article "What the Dealer Should Know About Fertilizers." which ran in the March and April issues of AGRICULTURAL CHEMICALS. *The article is being reprinted and copies will be available shortly. Single copies gratis, and larger numbers at cost. Soon to be published in this series, will be "What the dealer should know about insecticides, fungicides, herbicides, etc."*

AC

Also some nice words of encouragement on our new Custom Applicator Section . . . the first installment of which ran in our May issue. Aerial and ground applicators alike seem to be eager to tap every new source for information, which might help them in improving the efficiency of their operations. And to our new readers in the Custom Applicator group . . . your subscriptions and letters are much appreciated.

AC

"Ant Farms," plastic packed, viewable colonies of ants are setting sales records currently for E. Joseph Cassman & Co., Los Angeles plastic toy firm. Retailing at $2.98, Cassman has sold a million of these little transparent plastic containers partially filled with sand, and holding a colony of 15 ants. Last month the firm also started shipping a larger unit, stocked with 35 ants, which sells for $6.95. To make sure it gets a steady supply of ants, Cassman has established 20 persons in and around Los Angeles as ant breeders.

AC

Atomic energy has infiltrated the services available to the home gardener. Seed Irradiation Service, Long Island City, New York, will irradiate up to six ounces of seed for $5 and return the seeds to the sender for planting. They indicate that radiation produces remarkable effects, such as changes in color, resistance to disease, dwarfing, and higher yielding strains of plants. It's the "do-it-yourself" theme again . . . encouraging the amateur to "create his own interesting mutations."

AC

NBC's "TODAY" show invited Dr. Joseph Evans, duPont horticulturist, early in April, to demonstrate to its TV audience techniques for repairing damage to trees and giving instructions for correct pruning.

AC

From time to time AC staff members have been asked" who reads *Agricultural Chemicals?"* A new series starting this month on this page will describe typical readers, and what they think of the magazine. We wish to thank the participants in this series, starting with this first brief on Paul H. Mabry.

A TYPICAL AGRICULTURAL CHEMICALS SUBSCRIBER SAYS

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Paul H. Mabry is manager of the Agricultural Chemicals Division of the Kilgore Seed Company, a sales organization that operates a chain of 14 retail stores throughout the state of Florida. Kilgore formulates ready-to-use dusts for the Florida fruit and vegetable industry and formulates several soil fumigants, household sprays, nutritional sprays, and home and garden sprays. Mr. Mabry, who has been with the company for eight years, formerly was with the USDA and has been a teacher of vocational agriculture. He was graduated from the University of Florida with a BS degree in Agriculture.

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